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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 3 1943

THE CIRCULATION IN ARTERIAL HYPERTENSION*

BY

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LECTURE I

Raised arterial pressure has been suspected in man for over a century, and its degree has been measurable for over 40 years. The diseases with which it is associated are some of the commonest contemporary causes of death. The factors regulating arterial pressure have been the subject of earnest inquiry by physiologists from the time of Ludwig on. Yet we know comparatively little of what causes arterial hypertension in man, or indeed of what changes in the circulation it is the result. It is not surprising, therefore, that when confronted with a patient presenting raised arterial pressure the role of the physician, except in certain rare instances, is no more than that of comforter and friend.

In the last ten years a beginning has been made in analysing the nature of the circulatory disturbances which underlie hypertension in man, and in this first lecture I propose to outline the, as yet imperfect, picture which these investigations have revealed. This leads naturally to the subject of my second lecture—an inquiry as to how far the action of known pressor agents succeeds in reproducing the circulatory conditions encountered in disease.

Arterial hypertension is, like contracted pupils or enlarged heart, no more than a symptom or sign of disease, and, like them, may arise in more than one way. Hypertension is known to occur in acute and chronic nephritis, chronic pyelonephritis, polycystic kidney, pituitary basophilism, tumours of the adrenal medulla, pregnancy kidney, coarctation of the aorta, and in benign and malignant essential hypertension. To avoid the fundamental fallacy of confusing conditions essentially unlike, each of these conditions must be separately considered. So little is known of the circulation in some of these that they will not detain us long.

ESSENTIAL HYPERTENSION

In essential hypertension, which is by far the commonest of such maladies, we know that the raised arterial pressure is not due to increased output of the heart or to increased blood viscosity, for these have been measured and found normal. We may infer, therefore, that hypertension is due to narrowing of the vessels at some point or points in the vascular circuit. From measurements, by indirect methods, of the intravascular pressure at various points it would appear that the site of the vascular narrowing is in the small arteries and arterioles.† Thus in hypertension the rate at which the blood circulates round the body as a whole is normal; the hydrostatic pressure of blood within the vessels is abnormally high in the aorta and arteries, gradually falls to reach approximately the normal level as the blood traverses the arterioles to the capillaries, and remains normal as the blood flows through venules and veins back to the heart. If we concede the possibility that the rise of arterial pressure may serve some useful function, then the structure likely to benefit should be one on the arterial side of the circulation, such, for example, as the glomerulus of the kidney.

On this general background two important details remain to be filled in—namely, the distribution of this vascular narrowing, which determines the share of blood the individual tissues receive, and the nature of the agent constricting the vessels.

It is convenient first to consider to what extent structural changes in the vessels can directly account for raised pressure. Increased rigidity of the aorta and its main branches can be dismissed briefly. On theoretical grounds this can only lead to increased pulse pressure, the mean arterial pressure remaining unaltered. It is probably the cause of the pure systolic hypertension (diastolic pressure being normal); and it probably accounts for the relatively high systolic as compared with the diastolic pressure found in elderly subjects with hypertension of all kinds. It is not the cause of the raised mean arterial pressure. Atheroma, or nodular arteriosclerosis, need not detain us long. It is more frequent in subjects with raised than with normal pressures, and, occurring as it does in the larger arteries supplying organs such as brain and heart, is an important cause of symptoms and death in subjects with hypertension past middle life. Its occurrence and distribution are too irregular to account for the hypertension, and it involves the wrong order of vessels. As we have seen, it is in the small arteries and arterioles that we should look for the vascular narrowing, and here two kinds of structural change have been observed. A fatty hyaline thickening of the intima is found in the arterioles of the kidney (particularly the afferent glomerular arterioles) in about 98% of cases of essential hypertension, and less frequently in the spleen, pancreas, liver, and brain. But because these changes are often slight and affect relatively few vessels, and because they usually spare the important vascular territories of gut, muscle, and skin, histologists are agreed that they are not directly the causes of the raised pressure (see Fishberg, 1939). The cause of these changes is obscure, for they have not been produced experimentally; but it is to be mentioned that they also occur, though less frequently, in elderly subjects with normal arterial pressure, in which, however, as Moritz and Oldt (1937) have pointed out, the kidneys tend to be spared. The second change is that first described by Fahr as necrosing arteriolitis, a condition in which a granular mass staining brightly with haematoxylin and eosin appears in media or intima and greatly reduces the lumen. This change never occurs in the benign type of essential hypertension and is invariable in the malignant form, appearing chiefly in the kidney and to a lesser extent in the gut and other viscera; it is probably the chief factor determining the rapid course of malignant hypertension to the usual death in uraemia. Arteriolar necrosis, as it is now generally termed, is due to grossly raised intravascular pressure, as has been shown experimentally (Wilson and Pickering, 1937-8; Wilson and Byrom, 1939). It is therefore an effect of the hypertension and not its cause.

Further evidence for the view that structural arterial lesions are not directly responsible for the raised arterial pressure of

* An abridged version of the Oliver-Sharpey Lectures delivered before the Royal College of Physicians of London on March 23 and 25, 1943.

† The evidence for this conclusion is reviewed in a previous article (Pickering, 1939). See also Oppenheimer and Prinzmetal (1937).

essential hypertension is the normal vasodilator responses of the forearm and hand vessels to heat and reactive hyperaemia (Prinzmetal and Wilson, 1936; Pickering, 1935-6b; Stead and Kunkel, 1940) and the normal depressor response to intravenous injection of 0.1 mg. of histamine acid phosphate (Pickering and Kissin, 1935-6).

Thus it would seem that, while structural changes in the small arteries and arterioles may contribute, they are not the chief factors in the increased peripheral resistance which is the cause of the raised arterial pressure. The chief factor is evidently vasoconstriction, which may be of nervous or humoral origin. Its nature will become clearer when we consider the distribution of the vascular narrowing.

Experimental physiology has taught us that the vessels of the body behave as a series of units in their response to certain reflexes affecting the circulation and in response to vasoactive substances. Thus the skin vessels tend to behave similarly all over the body and in a way that is different from the vessels to muscle or brain when, for example, the body temperature is raised or adrenaline is injected intravenously. If the vascular narrowing in hypertension affected all the vessels to a similar degree, then in the first place we should expect each organ to receive its normal quantity of blood, and in the second we should have to search for some agent as the cause of essential hypertension which had a uniform action on different vessels. Alternatively, if the vascular narrowing were unequal, then blood would be diverted from organs in which the vessels were narrowest to those organs in which the vessels were wider; we should thus find some organs receiving less and some more blood than normal, and our agent should have a similar differential action on the vessels. One further and important point can be learned from a study of tissue blood-flow. If the vasomotor nerves are responsible for the abnormal vasoconstriction in hypertension, then if it were possible temporarily to eliminate their influence over one vascular territory while leaving the arterial pressure unchanged, the blood-flow through that territory should rise to much higher levels than in normal people subjected to a similar procedure; for, the effective agent being removed, the vessels to the part would be reduced to the same state in normal and hypertensive subjects, and blood-flow would be directly dependent on arterial pressure. These are the lines of thought which have led us to investigate the conditions of blood-flow through individual tissues in an attempt to identify the causative agent.

The Forearm

The first part to be investigated was the forearm. Early in 1936 Prinzmetal and Wilson, and I, independently, published measurements of the forearm blood-flow by the plethysmographic method of Hewlett and van Zwaluwenburg, using Lewis and Grant's plethysmograph. We each found similar rates of blood-flow in normal subjects and subjects with persistent hypertension, both at rest and in response to the vasodilator stimulus of circulatory arrest for 10 minutes. In addition Prinzmetal and Wilson found similar rates of flow in response to local heat and to warming the body or anaesthetizing the cervicodorsal sympathetic ganglia with novocain. For our present purposes these observations are largely of historical interest, and for two reasons: we did not know that the blood-flows also represented in part hand-flow, as Grant and Pearson (1937-8) later showed; and the forearm consists of two tissues —muscle and skin—in addition to bone.

The Skin

The circulation in the skin in the normal resting subject undergoes relatively large fluctuations directed to the maintenance of body temperature. This is particularly true of the hand, where blood-flow is estimated most easily; for the hand contains relatively enormous numbers of arteriolovenous anastomoses (Grant and Bland, 1929-31).

While the skin circulation is thus not suited to demonstrating small variations in blood-flow under resting conditions, it is in the hand admirably designed for investigating the nature of the agent narrowing the vessels, for sympathetic vasoconstrictor tone is easily removed by warming the body (Lewis and Pickering, 1931-3), and the main nerves to the hand are accessible to anaesthetization.

To investigate the blood-flow through the hand (Pickering, 1935-6b) the calorimetric method of Stewart was used in preference to the plethysmographic method because, although it does not actually measure blood-flow in c.cm. per 100 c.cm. per min., it is simple and robust, and the possible sources of error are more easily detected and controlled. To remove vasoconstrictor nervous tone from the hand, body temperature was raised by immersing the opposite forearm in water at 44° C. Evidence will be found in the original paper to show that heat elimination provided a true reflection of skin blood-flow in subjects with normal and raised pressures, and that the degree of body warming employed did in fact completely remove vasoconstrictor nervous tone from the hand vessels without stimulating vasodilator nerves (Lewis and Pickering, 1931-3; Grant and Holling, 1937-8) and without significantly altering arterial pressure. In this way it was shown that the blood-flow through the skin of the hand from whose vessels vasomotor nervous tone had been removed was no greater, but sometimes a little less, in 15 subjects with benign and malignant hypertension than in 21 subjects of comparable age with normal pressure (Fig. 1). Evidently, then, in essential hypertension the ha

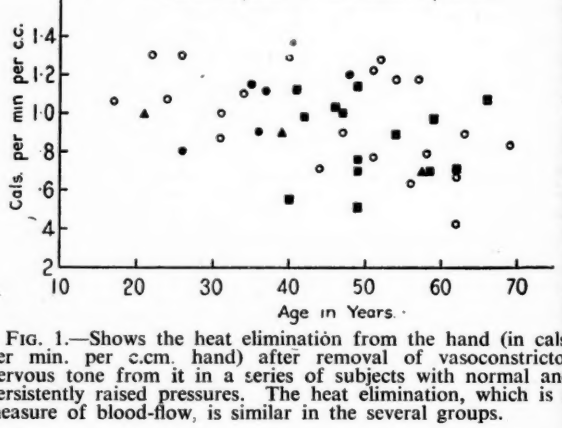

FIG. 1.—Shows the heat elimination from the hand (in cals. per min. per c.cm. hand) after removal of vasoconstrictor nervous tone from it in a series of subjects with normal and persistently raised pressures. The heat elimination, which is a measure of blood-flow, is similar in the several groups.

vessels are narrowed by a non-nervous agent, and this narrowing is of an order such that if generally distributed through the body it would account for the hypertension. Since the skin vessels are rarely and inconsiderably involved in the arteriolosclerosis of hypertension, the narrowing is presumably not of structural but of humoral origin. That the vasoconstriction, thus inferred in the hand vessels in essential hypertension, is not great enough to produce any detectable diversion of blood from the skin becomes an important point when we come to consider vasoconstrictor agents.

The Muscles

The observations on forearm blood-flow published in 1936 have been repeated by Abramson and Fierst (1942), who also used the Lewis–Grant forearm plethysmograph, but excluded the hand by arresting its circulation. If we assume that the plethysmograph was placed as high on the forearm as possible, then Grant and Pearson's investigations would indicate that about 85% of the tissue whose blood-flow they measured was muscle. They found that with the plethysmograph maintained at 32° C. (a normal skin temperature for the forearm) the blood-flow averaged 2.86 c.cm. per 100 c.cm. per min. in subjects with hypertension and 1.77 c.cm. in normal subjects. Moreover, if the subjects were grouped according to their systolic pressures it was found that the higher the arterial pressure the greater was the forearm blood-flow. Similar results were obtained in the calf. Abramson and Fierst unfortunately did not attempt to classify their subjects with hypertension, and we have to assume that their observations refer to essential hypertension, since this is by far the commonest condition. From their observations it seems, therefore, that the muscle vessels are either unconstricted or less constricted relative to the other vessels in the body, so that at rest the muscles get more than their normal share of blood. Observations on the effects of exercise on muscular blood-flow are difficult to make

ally quantitative, but, so far as they go, both Stead and unkel and Abramson and Fierst have found normal flows hypertension.

The Brain

If it is assumed that the metabolism of the brain is the me under different pathological conditions, any changes in erebral blood-flow should be reflected by changes in the arotid–jugular O_2 and CO_2 differences. Williams and Lennox 939) have found the values in 21 patients with hypertension be within the normal range. They also found normal values cerebral arteriosclerosis and high intracranial pressure, and ress the importance of the local regulating effect of CO_2 on e blood-flow through the brain.

Although it is therefore probable that the blood-flow through e brain as a whole is normal in essential hypertension, it is idely maintained that from time to time the cerebral arteries ow intense contractions leading to transient ischaemia of the ea of brain supplied. A careful consideration of the evidence nd of my own experience in this and other conditions has onvinced me that this hypothesis is unnecessary to explain the henomena of hypertensive encephalopathy, which I believe be due either to thrombosis in small cerebral arteries or, ore rarely, to acute cerebral oedema. My evidence against e hypothesis of vascular spasm chiefly depends on a series cases of transient cerebral disturbances occurring in mitral enosis and auricular fibrillation and undoubtedly due to erebral embolism. This evidence will be presented elsewhere.

The Kidney

The circulation through the kidney has always evoked the reatest interest because of the idea, subsequently fortified by oldblatt's work, that this organ might be the primary source the hypertension. The ingenious and careful experiments of omer Smith (1937, 1939, 1941) and his colleagues have thrown unexpected light on the renal circulation. Briefly, they have hown that a non-metabolized polysaccharide, inulin, is excreted man entirely by glomerular filtration. Its clearance—that , the volume of blood cleared of inulin per minute by the idneys—thus measures the rate of glomerular filtration, which its turn is dependent on the pressure in, and the rate of lood-flow through, the glomeruli. The rate of renal blood-ow can be measured by the diodrast clearance; for this sub-ance is excreted chiefly by the tubules, and at low plasma oncentrations its rate of excretion in normal subjects is such at, even assuming the kidney removes all the diodrast from e blood traversing it, the renal blood-flow must be of the rder of 1.3 litres per min., or about one-third of the cardiac utput.

In comparing the normal kidney and that in essential hyper-nsion the position is complicated by the variable amount of estruction of the renal substance, which becomes extreme in e malignant phase of essential hypertension. But here again e ingenuity of Smith and his colleagues is equal to the occa-on. For they have shown that when the plasma diodrast is ised to a high level the excretion reaches a maximum value affected by further plasma rise. This value is proportional the amount of functional tubular tissue and is termed e tubular excretory mass. Thus by relating the inulin nd diodrast clearances to the tubular excretory mass it is ossible to obtain a surprisingly complete picture of the circula-on through the functionally intact tissue of the kidney in ypertension.

Goldring, Chasis, Ranges, and Smith (1941) have investigated y such methods the renal circulation in 60 cases of essential ypertension of all grades of severity to the terminal malignant hase. The tubular excretory mass was reduced in all but 3 ases, and in the 8 patients in the malignant phase was between % and 38% of the normal value. The effective renal blood-ow inferred from the diodrast clearance was also reduced, eing between 41.7 and 1,176 c.cm. per min.; in 45 of 60 cases was more greatly reduced than the tubular mass, suggesting at some factor is operating in hypertensive subjects to produce relative ischaemia in the residual functional tubular tissue. he rate of glomerular filtration is much less reduced than the ubular functions, so that the fraction of the renal blood-flow ltered off in the glomeruli is increased: "Since the relative schaemia in these subjects is correlated with a rise in filtration fraction we conclude that the ischaemia is the result of increased resistance beyond the glomeruli—i.e., probably in the efferent glomerular artery."

Goldring, Chasis, Ranges, and Smith believe the constriction of the efferent glomerular arterioles to be of humoral origin, because it is not nervous and it can be relaxed. The vasoconstriction is not nervous in origin, because in essential hypertension the renal blood-flow is not increased, nor is the filtration fraction lowered, by operations in which the sympathetic nerves supplying the kidneys have been divided. The vasoconstriction can be relaxed through the induction of fever by intravenous injections of pyrogens which, in essential hypertension as in normal subjects, increase the effective renal blood-flow while leaving the filtration rate unaltered. The tubular excretory mass is usually not increased by the pyrogenic reaction, but in some subjects with essential hypertension it rises significantly, suggesting that substantial amounts of tubular tissue may be ischaemic under basal conditions. This argument rests chiefly on the decreased ability of the kidney in essential hypertension to excrete diodrast. I am, however, unable, after careful consideration, to see any satisfactory alternative to the explanation of their results adopted by these workers.

It seems, then, that there are intrinsically two changes in the kidney in essential hypertension: first, a reduction in the amount of functional renal tissue, inferred to be progressive and accompanied by a corresponding reduction of renal blood-flow; and, secondly, a relative ischaemia of the remaining functional tubular tissue due to narrowing of the efferent glomerular arteries. The first of these changes has long been suspected by those working on post-mortem material and attributed to structural vascular lesions, especially of the afferent glomerular arterioles. In malignant hypertension these arteriolar lesions are striking, and on experimental grounds have been attributed to the effects of a grossly raised intravascular pressure. The histologically distinct lesions in benign hypertension are of more uncertain causation. Smith and his colleagues also consider that the efferent glomerular vasoconstriction is an effect of the process of hypertension rather than in any sense its cause—a conclusion supported by Chasis and Redish's (1941) observations that vasoconstriction usually affects equally the two kidneys in essential hypertension.

Other Tissues

In a man of 1.73 sq. m. body surface the resting cardiac output, according to Grollman, is 3.8 litres, and the renal blood-flow, according to Smith, 1.3 litres per min. If we take Testut's figure of 30 kg. for the muscle in a man of 70 kg., the total muscle flow on the mean of Abramson and Fierst's figures would be 500 c.cm. per min. This leaves 2 litres per min. for distribution to skin, brain, gut, heart, and liver. In the subject with hypertension the cardiac output is similar; the renal blood-flow is variable, but we may take 0.8 litre as representative, and, accepting Abramson and Fierst's figures, 800 c.cm. would go to the muscles, leaving 2.2 litres per min. for skin, brain, gut, heart, and liver. So far as we know, brain and skin get similar supplies in the two instances. While any calculation based on composite figures, as this is, must be treated with reserve, the suggestion is that in the remaining tissues the blood-flow in hypertension is not grossly abnormal—except, of course, when structural vascular disease, especially atheroma, produces localized ischaemia.

Comment

The available evidence suggests that raised arterial pressure in essential hypertension is due to arteriolar constriction, and that this constriction probably affects the vessels to voluntary muscle little if at all; while in the skin vessels, and probably also in the cerebral vessels, its degree is just great enough to counter the effects on blood-flow of raised arterial pressure. In the kidney the efferent glomerular arterioles are constricted, and this narrowing is great enough to reduce the renal blood-flow. Finally, there is evidence, both from the skin and from the kidney, that the agent is not nervous but chemical.

COARCTATION OF THE AORTA

When studying the circulation through the skin of the hand (Pickering, 1935-6b) I was surprised to find that in coarctation, as in essential hypertension, the blood-flow was normal after

removing vasoconstrictor nervous tone. A chemical cause for the vascular narrowing thus demonstrated seemed out of the question, in view of the much lower arterial pressures recorded in the legs, where Lewis had found a normal blood-flow; and the vascular narrowing above the aortic constriction was attributed to a local change. Steele (1941) has since shown, by direct recording, that the diastolic arterial pressure is often nearly as high below the aortic constriction as above it, thus removing the argument against a humoral mechanism. A further similarity with essential hypertension is to be found in Friedman, Selzer, and Rosenblum's (1941) finding of a reduced effective renal blood-flow and normal glomerular filtration rate, inferred from the diodrast and inulin clearances.

NEPHRITIS

Chronic.—Vasoconstriction of non-nervous origin has been demonstrated in the skin of the hand in chronic nephritis as in essential hypertension (Pickering, 1935-6b). No information is available concerning muscle or cerebral flow; reduced blood-flow through the kidneys has been inferred (Chesley *et al.*, 1940), but there is no information as to what vessels are involved and how. Allegations that the hypertension behaves differently in chronic nephritis and essential hypertension have on repetition been unconfirmed (Pickering and Kissin, 1935-6; Pickering, 1935-6b).

Acute.—While all the varieties of chronic hypertension which I investigated behaved similarly in showing evidence of vasoconstriction in the hand after removal of sympathetic vasoconstrictor tone, acute nephritis behaved differently (Pickering, 1935-6c). During the phase of hypertension the blood-flow (as reflected by calorimetry) was in the upper normal range or above it, and in 4 of 6 cases was significantly greater than when the arterial pressure had returned to normal. The increase in maximum heat elimination from the hand produced by a given rise in arterial pressure—all other known factors, including the tone of the hand vessels, remaining constant—had been determined in a case of femoral arteriovenous fistula in which compression of the artery proximal to the fistula raised diastolic arterial pressure by 15 mm. Hg. In the four cases of acute nephritis the increase in heat elimination per unit rise of diastolic pressure was quite similar (Fig. 2); there was thus

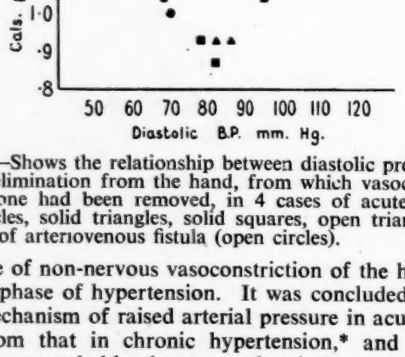

FIG. 2.—Shows the relationship between diastolic pressure and the heat elimination from the hand, from which vasoconstrictor nervous tone had been removed, in 4 cases of acute nephritis (solid circles, solid triangles, solid squares, open triangles) and in a case of arteriovenous fistula (open circles).

no evidence of non-nervous vasoconstriction of the hand vessels during the phase of hypertension. It was concluded, therefore, that the mechanism of raised arterial pressure in acute nephritis differed from that in chronic hypertension,* and that while the latter was probably due to a chemical agent the former probably was not. Similar results in 5 cases were obtained by Arnott and Matthew (1939). While no observations by the most modern methods have yet been published on the renal circulation in acute nephritis, Goldring and Smith's preliminary results, published in 1937, "suggest that renal hyperaemia may exist during a phase of acute glomerular nephritis." Unfortunately they did not state whether hypertension was present in this phase.

Published records give us a very incomplete picture of the circulation in nephritic hypertension, but, so far as they go, they suggest that in chronic nephritis the circulation behaves in much the same way as it does in essential hypertension, and is probably likewise humoral in origin. In acute nephritis the hypertension seems to arise from a different cause. If a chemical agent is involved it is peculiar in that it constricts neither the vessels of the hand nor apparently those of the kidney. A nervous mechanism is possible, though none has been demonstrated.

PREGNANCY TOXAEMIA

In a brief summary of work done before the war Kellar and Sutherland (1941) state that the heat elimination from the hand after elimination of vasomotor nervous tone was normal in 35 cases of toxaemia, but give no details. The renal circulation has been investigated by Corcoran and Page (1941), Chesley *et al.* (1940), and by Wellen, Welsh, and Taylor (1942), who are in substantial agreement. The glomerular filtration rate and the tubular excretory mass tend to be normal, while the effective renal blood-flow is increased. It is suggested that these changes are the result of efferent glomerular dilatation with possibly thickening of the glomerular basement membrane.

In pregnancy toxaemia, therefore, the circulation apparently presents some features similar, and some dissimilar, to acute nephritis. We must await further evidence to decide.

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(Lecture II, with a list of references, will appear next week.)

* It will be seen that in acute nephritis the "control" is provided by the same patient after recovery, and thus the factor of individual variation is excluded. I have had only two opportunities of measuring the heat elimination from the hand after removing the vasoconstrictor tone in different stages of chronic hypertension, and these support the conclusions already described. Thus in a case of progressive chronic nephritis arterial pressure was 138/80 and heat elimination 525 cals. per min. on Feb. 6, 1936; on Sept. 12, 1936, the corresponding figures were 146/96 and 480. In a case of essential hypertension passing from the benign to the malignant phase arterial pressure was 195/124 and heat elimination 281 cals. per min. on Nov. 1, 1935; on June 9, 1936, the corresponding figures were 234/144 and 290.

THE DIFFERENTIAL DIAGNOSIS OF SPINAL ARTHRITIS IN YOUNG SUBJECTS*

BY

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The symptoms of arthritis of the spine in young subjects may present a diagnostic problem of considerable difficulty and at the same time of the greatest importance in view of the rapid progress and grave developments in the more serious forms.

The Typical Form

The form most commonly seen in young people is that which is associated with the names of Marie and Strümpell, although its characteristic features had been described many years earlier by Hilton Fagge (1877) and others. The descriptive name of "ankylosing spondylitis" is now generally used; but Gilbert Scott (1942) advocated the name "adolescent spondylitis," as it usually begins at that period of life. Its rapid development and relentless progress to complete rigidity of spine, hips, and thorax, and later other joints, have been described elsewhere (Buckley, 1931). The earliest symptoms are vague pains in the back and limbs; sometimes at the outset they may be chiefly complained of in the limbs, but low back pain usually appears soon and is associated with flattening of the normal lumbar curve. At this stage the condition may be confused with adolescent kyphosis, but in the latter the gradually increasing curvature of the dorsal spine is usually associated with a compensatory increase of the normal lumbar curvature. As the disease progresses, the gait and facies are characteristic and striking.

The sequence of events is synovitis and inflammatory hyperaemia of the apophysial joints of the lumbar spine and usually of the sacro-iliac joints, followed very soon by implication of the costo-vertebral joints and extension to the dorsal spine. Osteoporosis of the bones forming these joints appears at the

* Based on a communication to the East Midlands Society of Physicians at Leicester, April 3, 1943.

same time, and may possibly be the primary change; this is probably due to hyperaemia of the bone substance and a raised *p*H, leading to absorption of calcium, which in turn tends to be re-deposited in the adjacent tissues where the *p*H is normal—mainly in the ligaments, joint capsules, and periosteum. The rarefying process rapidly spreads to the vertebral bodies, while the cartilage of the affected joints is gradually destroyed, the destructive process spreading from the periphery of the joints towards the centre. The intervertebral disks do not become thinned, but, on the contrary, sometimes expand from the turgor of the disks tending to compress the softened bone of the vertebral bodies. The apophysial joints and also the sacro-iliacs become ankylosed, and the calcification involves the ligamenta flava, which are in close relation to the joints, and extends to the other vertebral ligaments. The disease spreads from joint to joint, always in a centrifugal manner, missing none in the acute form of adolescence—first to the hips and costo-vertebral articulations, the sterno-clavicular and mandibular often before the knees and shoulders—but it generally ceases to extend before the smaller joints are reached. If the hands or feet are affected before or simultaneously with the spine the diagnosis is not ankylosing spondylitis, but infective arthritis, possibly of gonorrhoeal origin, affecting the spine.

Other Forms

While this is the typical form, spondylitis of a rather different character is often met with at a slightly later age—between 30 and 40 is usual. It is possible that this may have begun in earlier life in a mild form and undergone spontaneous arrest, to be roused again by strain, exposure, or other causes lowering the general resistance. I have met with several cases in the Forces. The condition is characterized by the fact that the changes in the apophysial joints are less pronounced and often absent in the mid-lumbar region; the sacro-iliac joints are only partially ankylosed or may escape, but the lower dorsal spine and the dorso-lumbar region show definite changes, partial or complete bridging of adjacent vertebrae by ossification of the ligaments being commonly present. Osteoporosis is less marked than in the adolescent variety and may not occur. The sex incidence seems to be different, and though males are still the more often affected, there is less disparity between the sexes. The disease is slower in development and often does not progress beyond the dorsal spine. Gold, which in my experience and that of many others is ineffective in the adolescent form, sometimes appears to do good in these cases. It is probable that these are the cases which have been described by Knaggs (1926) and others under the name "spondylosis ossificans ligamentosa" and which are characterized by systematic ossification of the ligaments but no changes in the apophysial joints or the disks. The dorsal spine is chiefly affected; the cervical and lumbar regions are less often attacked and mobility is not seriously interfered with, any loss of mobility being generally due to involvement of the apophysial joints. There are indications that the condition begins as a fibrositis of the spinal ligaments and not in the joints. Stockman (1926) states that "ossifying spondylitis" is due to the formation of new bone in chronically inflamed fibrous tissue, but the cases he records appear to include examples of both types described above and also cases of definitely infective origin. Fluorine poisoning has been shown to produce similar changes, generally appearing at an earlier age—about puberty: mottling of the dental enamel is a distinguishing feature.

Oppenheimer (1938), who has made an extensive study of the various forms of spinal arthritis, stresses the fact that ossification of ligaments is a very common and totally uncharacteristic response to a great variety of intervertebral lesions—inflammatory, degenerative, destructive, or traumatic. It is unfortunately the case, however, that the least sign of bony change in the spinal column is commonly labelled spondylitis, and the patient draws the conclusion that he is the victim of a chronic progressive crippling disease.

A disorder which may easily be confused with the early stages of adolescent spondylitis has been described by Rogers and Cleaves (1935) as "the adolescent sacro-iliac joint syndrome." They reported a group of cases which showed symptoms of low back stiffness, pain and tenderness over the sacro-iliac joints, often with sciatic pain and loss of straight-leg raising, sometimes unilateral, in others affecting both sides. They regard the condition as an epiphysitis, and point out that it may be confused with osteomyelitis, tuberculosis, or arthritis. These epiphyses appear about the fifteenth year and join up about the age of 20. It is probable that this condition is the same as that to which the name "sacro-iliitis" has been given and which has been erroneously regarded as the invariable precursor of ankylosing spondylitis. With rest and appropriate measures it tends to recover completely, and it seems probable that this result has led to the idea that certain methods of treatment applied in such cases have been responsible for the supposed arrest and cure of ankylosing spondylitis in its early stage. There may be some blurring of the line of the sacro-iliac joints in such a condition, and patchy osteoporosis, but not of the degree seen in spondylitis; and the apophysial joints are unaffected. It is analogous with the vertebral epiphysitis, described by Steindler (1929) and others, which occurs in adolescence and affects the epiphyses of the epiphysial ring that appear about the age of 14 and join up from 22 to 25 and is often the precursor of adolescent kyphosis.

Time of Onset

The onset of ankylosing spondylitis at an age when bone growth is active is probably responsible for some of its pathological characters, and it is remarkable that it frequently attacks robust and athletic youths rather than the weakly. It often happens that a history of an accident when playing is forthcoming, but in view of the frequency of such accidents it is doubtful how far they are of aetiological significance.

Another important feature is that the disease appears at the time when the sex glands are undergoing rapid development: the preponderance in the male sex suggests that the prostatic secretion may have some significance in view of the fact that it is rich in phosphatase, which has considerable influence on calcium metabolism—a possibility calling for further investigation.

It is believed by many authorities that ankylosing spondylitis is simply rheumatoid arthritis attacking the spine, but from this view I must differ. The predominance in the male sex, the much greater tendency to ankylosis than in rheumatoid arthritis, the strictly centrifugal spread, and the lack of any effective relief from gold are all strongly against the rheumatoid theory; and other grounds might be stated. Whether the form appearing in adult life is related to rheumatoid arthritis or originates as a form of fibrositis is a question less easily settled. It has been found that the tuberculin-sensitiveness is about 30% higher in the subjects of ankylosing spondylitis than in a series of rheumatic control cases without evidence of active tuberculosis (Robinson, 1940).

X-ray Appearances

It should be an invariable practice in all cases of pain in the lower back and limbs in young subjects to have an *x*-ray examination without delay. A history of vague and fleeting pains in adolescents should not be lightly regarded, for such symptoms may go on for months before anything serious is suspected. In some cases the limb pains predominate and the back pains are later in appearing. While antero-posterior and lateral views of the lumbar spine and pelvis may reveal some changes, especially in the region of the sacro-iliac joints, the most important view to be taken is a three-quarter lateral, at an angle of 45 degrees, which in most people is the only one that will show the lower lumbar apophysial joints. A loss of density in the articular processes, together with a blurring of the outlines of the joints, is among the earliest signs of spondylitis, and if associated with such symptoms as mentioned above and an accelerated sedimentation rate the diagnosis is reasonably certain.

Treatment

Rest is imperative in the early stages, preferably in bed on a hard mattress; if any tendency to kyphosis has begun to appear a plaster shell, on the lines described by Pemberton and Osgood (1934), may be necessary. As the more acute symptoms subside a plaster jacket may be applied, reaching from the upper part of the spine to below the iliac crests, as advised by Swaim (1939); this will need to be worn for months and be followed by a spinal brace. Care must be taken to provide an ample diet of milk and other sources of essential vitamins and calcium, and cod-liver oil is of much value. Heliotherapy

and ultra-violet irradiation will help to improve calcium metabolism, while infra-red rays often give much relief from pain. Breathing exercises are of the greatest importance in preventing, so far as is possible, the tendency of the costo-vertebral joints to ankylose; they also have a beneficial effect on the general condition. Deep *x*-ray therapy has been credited with good results in some cases. I have not found drugs of any service except for relief of pain, for which aspirin, or in severe cases tab. codein. co., will be useful. Gold, as already stated, is quite ineffective in the adolescent form, and the same may be said for vaccines.

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A STUDY OF THE ACCURACY OF SERUM PROTEIN ESTIMATIONS AND OF DIURNAL VARIATIONS IN THEIR LEVEL*

BY

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AND

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The object of the present investigation was: (i) to estimate the degree of accuracy obtainable in our hands with two methods of serum protein estimation in common use; (ii) to determine whether there is any diurnal variation in the level of serum proteins in the normal individual under ordinary conditions of activity and food intake.

Methods

Serum was used in preference to plasma for the following reasons: (*a*) haemolysis is less likely to occur in serum than in plasma; (*b*) there is a theoretical possibility that the presence of oxalate may, by withdrawing water from the cells, dilute the plasma, while the presence of heparin, which contains nitrogen, must make any estimation of protein inaccurate; (*c*) in another investigation in progress, necessitating the estimation of proteins, it is more convenient to use serum than plasma. It was therefore preferable to have a base-line in terms of serum than of plasma proteins. The methods used were:

(i) Proteins were precipitated with zinc sulphate and caustic soda and estimated by the micro-Kjeldahl method as described by Pregl (1937) and Niederl and Niederl (1938). In the samples taken at two-hourly intervals the result recorded represents the mean of two determinations. (ii) The method described by King and his co-workers (King, Haslewood, and Delory, 1937; King, Haslewood, Delory, and Beall, 1942), in which Kjeldahl digestion is followed by Nesslerization and colorimetric estimation. The colorimetric readings were made with a Hellige colorimeter in a dark-room. Owing to war conditions a Klett violet filter, as advised in the original paper, was unobtainable; an Ilford blue filter was therefore used. In the samples taken at two-hourly intervals the result recorded represents the mean of two determinations.

Results

Accuracy of the Method.—To test the accuracy of the method it would have been satisfactory to estimate the protein content of 100 samples of the same serum on the same day. Owing to the time and apparatus required for the micro-Kjeldahl method this was not practicable. Ten estimations were therefore made on each of 10 samples of the same serum by both methods. This procedure was carried out for 10 different sera, giving 100 estimations in all (Table I). These figures were treated in two different ways to determine what difference in any two results should be attributed to technical error. First working on the basis that any two of these values observed for a given serum might have occurred in actual practice, the distribution of differences between the 10 values was determined. Each 10 results thus gave 45 differences (or 90 if read both ways). There were in all, therefore, 450 differences, each 45 based on a separate experiment. The number of differences of various sizes was very similar for each of the 10 sera, though the average value of the latter varied from 6.06 to 7.48 with King's method and from 6.03 to 7.4 with the micro-Kjeldahl method. Within this range it seems, therefore, that errors of observation will be of the same magnitude. Adding them together for the 10 sera gives the figures shown in Tables II and III. With King's method (Table II) it seems that differences as large as 0.3 and even 0.4 will occur quite frequently with the same serum, for 11% of them were 0.3 and 8% were 0.4. A difference as large as 0.5 is rare, for there was only 1 in 100. With the micro-Kjeldahl method, on the other hand (Table III), it appears unlikely that differences over 0.2 will be obtained in testing the same serum (only 2 in 100), and fairly unlikely that any over 0.15 (only 6 in 100) will occur. As a satisfactory rule, according to this method of analysis, changes of under 0.15 should be ignored with the micro-Kjeldahl method as too likely to be due to errors inherent in the technique, changes of 0.15 to 0.2 as probably significant, and those over 0.2 as almost certainly significant.

TABLE I.—*Estimations from Ten Samples of the Same Serum, using King's Method and the Micro-Kjeldahl Method. Estimated with 10 Different Sera*

Serum	*King's Method*			*Micro-Kjeldahl Method*		
	Mean Reading	Mean Difference	Max. Difference	Mean Reading	Mean Difference	Max. Difference
1	7·48	0·14	0·3	7·40	0·056	0·14
2	7·23	0·18	0·4	6·79	0·054	0·16
3	6·91	0·16	0·4	6·69	0·086	0·22
4	6·27	0·17	0·4	6·26	0·069	0·17
5	6·45	0·24	0·5	6·38	0·067	0·18
6	7·10	0·16	0·4	6·80	0·049	0·14
7	6·06	0·16	0·4	6·03	0·070	0·18
8	6·97	0·14	0·4	6·95	0·053	0·14
9	6·66	0·09	0·2	6·67	0·072	0·22
10	6·76	0·10	0·3	6·75	0·079	0·21

TABLE II: KING'S METHOD.—*Grouped Differences in Value of Serum Proteins, using 10 Samples of the Same Serum and 10 Different Sera, compared with Similar Differences observed on 5 Samples withdrawn at Two-hourly Intervals from Each of 20 Normal Subjects*

Differences in g.	Differences between Estimations on the Same Serum		Diurnal Variations	
	No. of Diffs. Observed	% Frequency	No. of Diffs. Observed	% Frequency
0·0	113	25	47	25
0·1	121	27	78	41
0·2	123	27	32	17
0·3	50	11	25	13
0·4	37	8	8	4
0·5	6	1	1	0·5
0·6	—	—	1	0·5

TABLE III: MICRO-KJELDAHL METHOD.—*Grouped Differences in Value of Serum Proteins, using 10 Samples of the Same Serum and 10 Different Sera, compared with Similar Differences observed on 5 Samples withdrawn at Two-hourly Intervals from Each of 20 Normal Subjects*

Differences in g.	Differences between Estimations on the Same Serum		Diurnal Variations	
	No. of Diffs. Observed	% Frequency	No. of Diffs. Observed	% Frequency
0·00	175	39	58	30
0·05	171	38	59	31
0·10	77	17	40	21
0·15	20	4	22	12
0·20	7	2	6	3
0·25–0·35	—	—	7	4

The same figures were treated in a different manner with approximately the same results. An average standard deviation from the total 100 values was obtained by calculating the sum of the squared deviations from the observed means in each set of 10 tests on the same serum, adding all these squares together, and dividing by 90 (the number of degrees of freedom left). This standard deviation from the 100 values for King's method was 0.1416 and for the micro-Kjeldahl method 0.0574. The test of significance between any two observed values was then measured by the standard deviation multiplied by $2\sqrt{2}$. Differences as large as this value would be expected to occur by chance only once in 20 trials. With King's method, therefore, the difference between two values has to be at least 0.4 and with the micro-Kjeldahl technique at least 0.16 to be significant.

Either method of treating the figures shows that the micro-Kjeldahl technique is the more accurate.

* A report to the Medical Research Council from the N.W. London Blood Supply Depot.

It should be noted, however, that if a number of estimations were made on the same serum, apparently as accurate an answer would be obtained by King's method as by the micro-Kjeldahl, as the means in the above series with the exceptions of sera 2, 3, and 6 are in close agreement. King's method presumably involves larger chance errors, which swing either side and therefore balance out. It is, however, in practice not possible to make a number of estimations, and therefore the micro-Kjeldahl is preferable.

Diurnal Variations

To determine whether there is a significant diurnal variation under ordinary working conditions 5 samples were taken, at two-hourly intervals, from 20 healthy members of the staff between the ages of 18 and 50. With one exception these subjects were all living under approximately the same conditions as regards diet—i.e., they all had some meals during the week in a canteen or restaurant in addition to their own ration. The exception was an unmarried woman living alone. All subjects were working in the N.W. London Blood Supply Depot and carried on their normal active duties. The first sample was withdrawn from a vein in the ante-cubital fossa between 9 and 10 a.m.; the subject then continued normal work throughout the day, further samples being withdrawn at two-hourly intervals. The mean figures for serum protein estimations made at two-hourly intervals on each of 20 normal individuals are shown in Table IV. The figures were treated in the same manner as described for the estimations on samples on the same serum. The values

TABLE IV.—*Diurnal Variations of Serum Protein Concentration in g. per 100 c.cm. (Two-hourly Samples) in 20 Normal Subjects*

No. of Subject	*King's Technique*			*Micro-Kjeldahl Technique*		
	Mean Reading	Mean Difference	Max. Difference	Mean Reading	Mean Difference	Max. Difference
1	7·08	0·26	0·6	7·25	0·144	0·27
2	7·44	0·06	0·1	7·39	0·092	0·18
3	7·40	0·08	0·2	7·41	0·070	0·14
4	7·02	0·21	0·4	7·11	0·080	0·19
5	7·42	0·10	0·2	7·08	0·056	0·11
6	7·32	0·04	0·1	7·21	0·088	0·20
7	6·88	0·14	0·3	7·08	0·074	0·14
8	7·38	0·10	0·2	7·24	0·096	0·20
9	6·94	0·16	0·4	6·93	0·070	0·16
10	7·14	0·10	0·2	7·17	0·096	0·18
11	7·18	0·18	0·3	7·16	0·087	0·14
12	6·46	0·16	0·3	6·31	0·048	0·11
13	7·08	0·22	0·5	6·96	0·142	0·27
14	6·92	0·22	0·4	7·02	0·144	0·32
15	7·16	0·14	0·3	7·11	0·086	0·16
16	7·20	0·21	0·4	7·17	0·172	0·35
17	7·23	0·18	0·3	7·17	0·040	0·07
18	7·30	0·08	0·2	7·15	0·046	0·10
19	7·40	0·08	0·2	7·28	0·044	0·09
20	7·38	0·04	0·1	7·29	0·070	0·13
Mean ..	7·17	0·14	0·29	7·12	0·088	0·176

for the 20 individuals show immaterial changes during the day by either King's or the micro-Kjeldahl method (Tables II and III). On the other hand, the distribution of pairs of differences for each individual shows that with the micro-Kjeldahl method rather more relatively large differences occur than were found in the tests of experimental error—19% are over 0.15 against 6% (Table III). Therefore, if tests are being done at different times of day a slightly larger difference for significance should probably be demanded than that previously given. Differences of more than 0.2 g. should be regarded as very suspicious and differences over 0.25 g. as most likely significant.

The average standard deviation method gives much the same answer, since its significance level for the micro-Kjeldahl technique will be a difference of 0.22 g. between two values, the standard deviation for the combined figures being 0.0781. King's method gives a rather lower variability in the diurnal tests than in those of experimental error, the standard deviation in the former being 0.128 and in the latter 0.142. In either case the significance level for the difference between two observations will be about 0.4.

The mean of each series of five values on 20 normal individuals ranged from 6.31 to 7.41 g. per 100 c.cm. (micro-Kjeldahl) and 6.46 to 7.44 g. per 100 c.cm. (King). The mean for the whole series was 7.12 ± 0.008 (micro-Kjeldahl) and 7.17 ± 0.013 (King). The only figure for serum protein below 6.59 g. per 100 c.cm. occurred in a single middle-aged woman living alone.

Discussion

Two facts regarding the interpretation of serum protein estimations emerge from a consideration of the figures given above:

(i) That there is an error inherent in the method of estimation which must be considered in drawing any conclusion from the results, and, further, that this error varies from method to method.

(ii) That if tests of serum protein are done at different times of day on subjects leading a normal active life a slightly larger difference for significance should be demanded than if repeated estimations are made on the same sample or on samples taken very close to one another in time. The variation, however, is slight. A difference greater than 0.169 per 100 c.cm. appeared to be significant on repeated estimations on the same sample by the micro-Kjeldahl technique, while on samples taken at intervals throughout the day under standard conditions differences of over 0.25 g. are probably significant.

Perera and Berliner (1943) report rather larger differences on repeated samples taken throughout the day from 10 a.m. to 10 p.m. on 10 normal individuals whom they describe as ambulatory. This may be due to the fact that their normal subjects took more exercise or altered their posture more than the subjects in the present study, since many observers (Böhme, 1911; Cipriani and Moracchini, 1925; Thompson, Thompson, and Dailey, 1928; Bock *et al.*, 1927; Youmans *et al.*, 1934) have emphasized the effect of both posture and exercise on protein levels. Perera and Berliner themselves record a consistent fall in serum proteins of about 0.8 g. % in ambulatory patients during the night. In persons staying up all night and sleeping during the day the fall occurred during the day, making it evident that the fall was associated with rest in the recumbent position. Bed-rest alone appears sufficient to reduce serum protein levels to what are often regarded as pathological figures.

The effects of possible changes in posture and activity have in the last few years to a large extent been ignored by workers who have stressed variations in the level of serum or plasma protein as a method of calculating changes in the balance of both fluid and protein between tissues and circulating fluid (Black, 1940; Ebert and Stead, 1941; Ebert, Stead, and Gibson, 1941; Beattie, 1942; Beattie and Collard, 1942a, 1942b).

It is clearly essential to standardize both the activity and posture of the subjects and the methods employed if small variations in serum protein are to be considered significant. Single estimations should not be made after prolonged rest in the recumbent position.

Summary

Observations have been made on the accuracy of King's method and the micro-Kjeldahl method in the estimation of serum protein.

The figures obtained suggest that differences of more than 0.25 g. obtained by the micro-Kjeldahl technique are almost certainly significant, while with King's method differences must be greater than 0.4 g. to be significant.

No great variation in serum protein was found in 20 normal individuals leading an ordinary working life between the hours of approximately 9 a.m. and 6 p.m.

It is suggested that many variations in serum protein recorded in the literature are not significant and that changes in the character of tissue and circulating fluid cannot be calculated from changes in serum protein unless accurate methods with a known technical error are employed and standard conditions of posture and exercise adopted.

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H. J. Gareau (*Canad. med. Ass. J.*, 1942, **46**, 51) gives a report on 75 cases of acrodynia, in 57 of which the tonsils and adenoids were removed in the course of treatment. In these cases, the author states, the average total duration of the illness was less than 3½ months, and as this is less by 2½ months than the usual course he presumes that acrodynia is due to a toxaemia caused by infected tonsils and adenoids.

THE CONTROL OF MENOPAUSAL FLUSHES BY VITAMIN E

BY

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It is the practice to treat a woman with menopausal flushes with some form of oestrogen, and as stilboestrol is so potent a form even when administered orally, stilboestrol dipropionate is commonly prescribed. Oestrogen treatment has several disadvantages, however—notably (*a*) that four or five days after stopping the pills the patient has a return of menstrual discharge, usually accompanied by general malaise; (*b*) if an oestrogen is taken over a prolonged period it may have a toxic action, may worsen any heart irregularity present, and may encourage any dormant tendency to cancer that exists. Regarding the first of these tendencies, it was the experience of Zondek and Bromberg (1942) that non-pregnant women showed toxic symptoms with doses of oestrogen which in their pregnant state were tolerated with ease. Regarding the last two possibilities, since the climacteric often sees the first symptoms of cancer and sometimes gives rise to various cardiac upsets, the importance of avoiding anything that may help to bring about either of these conditions is obvious.

The reason that vitamin E was given a trial in this connexion was the passing statement of Shute (1939) that, among other beneficial uses, wheat-germ oil relieves menopausal flushes and headache; no data were given in support of his statement, which seemed worth investigating. It was intended to secure the co-operation of several patients, but, as circumstances prevented this from being carried out with the completeness desired, data will be given of only two patients fully, and in other cases such facts as are available.

It is hoped that doctors will try this mode of therapy in preference to the use of oestrogens, and report their results. It should not be necessary to remark that a distinction should be drawn between true menopausal flushes and those due to other contributory causes.

Case A

The patient had had a hysterectomy done at 45 years of age for metropathia haemorrhagica. Menopausal flushes started in the summer of 1942, when she was almost 47. In October of that year she was having 11 to 13 flushes daily—i.e., in the 12 hours from 9 a.m. to 9 p.m. A record was kept each day for a week prior to the taking of vitamin E. As it was considered advisable to use a form of vitamin E of known strength, viteolin (Glaxo Laboratories Ltd.) was prescribed; this is standardized at 6 mg. of tocopherol per capsule. The patient started with two capsules daily, and was told to reduce these to one a day if the flushes showed a marked improvement. If they ceased the capsules were to be continued at the rate of one a day until a fortnight had elapsed without a single flush. The record, which was kept very conscientiously, was as follows:

TABLE I.—*Case A: Results with Vitamin E*

No. of Capsules Daily	No. of Flushes Daily						
	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.	Mon.
2	10	9	3	1	3	3	4
2	5	11	3	3	5	2	6
1	1	4	2	6	3	1	2
1	1	1	0	1	3	2	1
1	1	1	1	3	3	1	2
2	5	2	0	1	0	1	0
1	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
1	2						

The patient observed that although at the end of the first week of taking the capsules the flushes were not so numerous, they were getting stronger, and for this reason she continued to take two capsules daily. By the end of the second week the reverse had happened, and, although more numerous, they were weaker, and the capsules were reduced to one a day. The data pertain to October to December. On Dec. 29 she wrote: "The flushes vary from none at all to one or two a day, and I have stopped taking the capsules. Do you know," she adds, "I found it a sort of relief to have those two flushes after more than a fortnight without them. They seemed to clear the brain!" And on Jan. 20, 1943: "I now have a flush only now and then—say one in three days during the last two weeks," during which time no viteolin was taken.

In Case A some of the general symptoms that accompany the climacteric were present, notably rheumatism (which was more severe than it had been at any time since she had rheumatic fever in childhood) and rapidly failing vision. Donald (1938) reported that a course of combined oral and injected oestrogens afforded the patient considerable relief of these symptoms. It is not clear what effect, if any, resulted from the use of vitamin E in our case, as remedial exercises were taken for the rheumatism and the carrying of heavy parcels was avoided.

Case B

This patient had a natural menopause at 50 years of age. Menopausal flushes had been experienced for a considerable time before treatment was begun in Oct, 1942, when she was 55. At this time the flushes, which were severe, numbered 7 to 9 a day, and she was put on stilboestrol dipropionate, 2 mg. daily. From the fifth day onwards her record was as follows:

TABLE II.—*Case B: Results with Stilboestrol Dipropionate*

No. of mg. Daily	No. of Flushes Daily						
	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
2	5	6	3	1	1	0	0
0	2	1	0	*	*	*	*
0	—	—	—	6	2	4	2

On the days marked with an asterisk a few drops of blood were passed and the discharge was accompanied by abdominal discomfort and headache, symptoms which would, of course, have been deferred had the stilboestrol been continued. The cessation of hormone therapy was followed by a return of the flushes, which in January of this year were as numerous and as severe as before hormone therapy was started. The patient was then treated with vitamin E, and took two capsules of viteolin daily for 18 days. There was no reduction in the number of flushes until the 16th day, when they fell to three and remained between two and four daily for seven days, for the last five of which she took only one capsule daily. During the whole of this period, and subsequently, the patient noticed that on the days when she did upholstery, which was strenuous work and necessitated stooping, the flushes were almost doubled—11 to 13 instead of 6 to 9 daily, as can be seen in Table III.

TABLE III.—*Case B: Results with Vitamin E*

No. of Capsules Daily	No. of Flushes Daily						
	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
2	—	—	—	—	—	5	3
2	6	12*	13	11	9	8	9
2	7	7	9	4	7	6	3
1	2	2	3	4	3	4	4
0	3	7*	10	9	9	11	8

* Upholstery was done on this and the four succeeding days.

In this case it is doubtful if the patient derived any benefit from vitamin E, as, unfortunately, therapy ceased just as a possible effect was manifesting itself. She certainly seems to have done better on oestrogen therapy.

Cases C and D

Case C had pruritus vulvae in addition to menopausal flushes, and this was now cured by viteolin after oestrogen therapy had been tried and had failed. As the flushes also ceased under this treatment the viteolin was stopped. Later on, the pruritus returned (but not the flushes), and viteolin had to be resumed. It appears to be advisable to continue small doses of vitamin E for some time after symptoms have ceased.

Case D had considerable relief, as flushes were reduced from 10 to 15 to 3 or 4 daily.

It would seem from the few cases examined that, before vitamin E can be said to have been given a fair trial, the patient should take two capsules daily for three weeks and one daily for the succeeding two months. As it is probable that long-standing cases respond less readily than others, the higher

dosage should preferably be continued by patients in this category until only one or two flushes are experienced daily.

Discussion

The facts given suggest that in vitamin E therapy we possibly have an alternative method to oestrogen therapy for combating menopausal flushes. If this be so—and the data are so few as to be merely suggestive—its mode of action is not clear. The changes which take place at the menopause lack uniformity and vary greatly in severity. It is unlikely, therefore, that an equal response will be obtained in all cases, and possibly one treatment will succeed where another has failed. As has been said, oestrogen is generally prescribed for menopausal flushes, the rationale being that, given in large doses, it depresses pituitary function at a time when considerable amounts of gonadotrophin are being excreted in the urine (Frank and Salmon, 1935; Jones *et al.*, 1937). The flushes are held to be an indication of oestrogen insufficiency, yet it has been demonstrated by Robson *et al.* (1934), Frank (1934), and others that in some cases oestrogens are recoverable from the blood and urine in considerable quantity for as long as 20 years after the menopause, although in other women there may be none at the end of three years.

The rationale for the employment of vitamin E in the control of menopausal flushes is all the more obscure as Shute (1939), its advocate, considers vitamin E to be anti-oestrogenic—a thesis which others, however, have failed to confirm (Drummond *et al.*, 1939).

It is always dangerous to cite effects on animals in an article dealing with the human subject, because of the similarity that such a reference tends to imply. Subject to this caution, and bearing in mind that the experimental results that have been obtained on animals do not indicate that the endocrine system is primarily responsible for the changes observed after feeding on an E-deficient diet (Mason, 1939; Drummond *et al.*, 1939), certain tangible results of E-deficiency stand out in a sphere in which many claims have too readily been made. Thus there is evidence of a reduction in the pituitary principle responsible for causing ovulation in vitamin-E-deficient rabbits (Rowland and Singer, 1936; Drummond *et al.*, 1939) and of thyroid deficiency in rats deprived of the vitamin (Singer, 1936; Barrie, 1937).

This latter finding may have some bearing on our problem, as a mild degree of myxoedema is commoner in menopausal women than states of true hyperthyroidism (Donald, 1938), and it is possible that one of the ways in which vitamin E acts is by relieving this condition, at the same time causing an improvement in the emotional and physical state. If this be so, such women are more likely to benefit by vitamin E therapy than those in whom menopausal flushes are combined with hyperthyroidism, who would benefit from oestrogen therapy rather than from vitamin E. The preferential response to stilboestrol in Case B may perhaps be explained on these lines, as she had manifest symptoms of hyperthyroidism, which were wanting in Case A, which responded well to viteolin. Relevant to this aspect is the fact that in the treatment of involutional melancholia in menopausal women Hemphill and Reiss (1940) noted that the patients who derived greatest benefit from oestrogen treatment were those in whom a lack of ovarian function was combined with a considerable degree of hyperthyroidism, whereas the symptoms seemed, if anything, to be aggravated in those with hypothyroidism. Since oestrogens inhibit the thyrotrophic action of the pituitary, their indiscriminate use may be harmful if thyroid insufficiency is present.

Arising out of this study, Reiss and Golla (1940) considered the possibility that the endocrines might have an influence on cerebral circulation, and their investigations suggest that in castrated animals the blood content in the brain is considerably lowered and can be increased by treatment with sex hormones. In our effort to ascertain if any similar action has been claimed for vitamin E we have encountered the statement by Wortis and Jolliffe (1941) that the vitamin "has a vasodilator action." If this can be substantiated we would have one property common to both substances—viz., a levelling-up of cerebral blood flow which would counteract sudden cerebral congestion. (Side actions would be provided in a stimulus to muscular metabolism as well as a probable psychological effect.)

Reynolds (1939), on this aspect, states that the effect of oestrogens upon the venous pressure in ovariectomized women is to lower this appreciably within the short space of 6 to 8 minutes—a diminution which may be the result of a general increase in the size of the subcutaneous capillary bed, since capillary pressure diminishes coincident with the change in venous pressure. He considers it probable that the basis of the adjustment is a shift of part of the blood volume from the visceral regions to the somatic capillary bed as a moderate but extensive capillary vasodilatation takes place. Inevitably associated with this would be an alteration in the heat-regulating capacity of the individual, increasing the heat loss by radiation and conduction, and so minimizing the need for loss by evaporation. This, he avers, should minimize the amount of nervous activity of the sympathetic system which heat regulation by sweating entails. Such a peripheral vascular action of oestrogens would account for their relief of the acute menopausal disturbances on the basis of well-established physiological grounds through readjustment of normal heat-regulating mechanisms.

Conclusion

Although a case has not been made out for the alleviation of menopausal flushes with vitamin E, as claimed by Shute, the few cases described suggest lines along which patients might be selected for this mode of therapy, and it is hoped that it may be given a trial, especially where an idiosyncrasy for oestrogens exists.

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HEMIPLEGIA COMPLICATING WHOOPING-COUGH

BY

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The occurrence of a complete and permanent hemiplegia during whooping-cough is a very unusual type of neurological complication: there is, in fact, no record of such a case at this hospital in 20 years. We feel, therefore, that the following case should be recorded, especially in view of the opinion of some authorities—e.g., Nelson (1939)—that it is desirable to report all cases of whooping-cough showing permanent neurological sequelae. The present case was further complicated by subcutaneous emphysema.

Case Report

A boy aged 5 was admitted on Sept. 25, 1941, with a history of cough for a month and occasional vomiting. He had first been heard to whoop three weeks before admission. On examination the child was found to be very ill; temperature was 102.8° F., pulse 130, respirations 60. He was cyanosed, the alae nasi were working, and there were recession and signs of a patchy pneumonia at both bases. Although next day the temperature had subsided to 100°, the pulse was still rapid and signs of bronchopneumonia became more extensive, involving the whole of the right lung and the major portion of

the left. Sulphapyridine 0.5 g. was administered four-hourly. The temperature came down and gradually the bronchopneumonia began to clear, though the general condition was not greatly improved. Spasms of coughing accompanied by whooping and vomiting were still severe, cyanosis was frequent, and the respiration remained rapid, averaging 60.

On the ninth day after admission the boy suddenly developed a marked degree of subcutaneous emphysema of the upper chest, neck, and cheeks, and was severely cyanosed. The lungs showed a patchy impairment of percussion note and there were some coarse moist rales at the bases. A radiograph at this stage (see fuller report below) showed subcutaneous emphysema, hilar gland enlargement, and bronchitic changes, but no evidence of collapse. Four days later the subcutaneous emphysema had practically disappeared and the sulphapyridine was reduced to 0.5 g. six-hourly. On the fourteenth day after admission the chest was definitely clearing, the colour and pulse were much improved, and chemotherapy was discontinued. On the sixteenth day the temperature rose suddenly to 103° F. and continued raised in spite of the resumption of chemotherapy. Coarse moist sounds were heard all over both lungs.

On the night of the eighteenth day twitchings of the limbs of the left side were noticed, and later in the same day the left side of the face was similarly involved. Despite treatment with bromides and chloral the twitchings continued and spread to the left arm. The next day the whole of the left side was affected, the twitchings being of a Jacksonian character and increasing both in frequency and in duration. There was no evidence of paresis in the intervals, though the child was very drowsy and resentful of movement and painful stimuli. The pupils were equal, regular, central, and reacted briskly to light. Abdominal reflexes were absent on the left side and there was a left extensor plantar response. There was no neck rigidity; Kernig's sign was absent; tendon reflexes on both sides were difficult to elicit but not significantly unequal. There was no evidence of papilloedema.

By the twenty-first day there was a complete left hemiplegia of a flaccid type. A lumbar puncture secured about 4 c.cm. of crystal-clear fluid, not under pressure. C.S.F. examination showed protein 30 mg., no excess of globulin, sugar 57 mg. per 100 c.cm., and white cells not in excess; cultures remained sterile. Chlorides were not estimated. At this stage and before the result of the examination of the cerebrospinal fluid was available, the possibility of cerebral abscess was considered. Mr. D. W. C. Northfield (neurosurgeon, E.M.S.) saw the patient in consultation, but doubted the presence of an abscess in view of the absence of papilloedema, the normal pulse, the normal pressure of the spinal fluid, the rapid evolution, and the evidence of more widespread disturbance of cerebral function. The possibility of encephalitis or a vascular lesion was suggested. The child vomited several times during that day and remained drowsy, rapidly becoming more dehydrated and wasted, and doubly incontinent. Consciousness, however, was not so clouded. Three days later lumbar puncture was again performed and about 10 c.cm. of crystal-clear fluid, this time under pressure, withdrawn. Examination of this showed protein 20 mg., globulin no excess, sugar 68 mg., no excess of white cells, no organisms. The next day the child was much brighter and able to answer simple questions, and this improvement in his mental state continued. During the next two months the boy put on flesh, and regained a practically normal mentality, but the hemiplegia persisted and became progressively more spastic.

The patient has since been transferred to another hospital, where he has not been seen by us. A recent report received by the kindness of Mr. Northfield states that on Sept. 7, 1942, the child had an epileptiform fit restricted to the left side and starting with convulsive movements of the left leg, without loss of consciousness. Encephalography was performed, which demonstrated gross atrophy of the right cerebral hemisphere, with enlargement of the right lateral ventricle.

Radiological Appearances through the Course of the Illness

Oct. 6, 1941.—Surgical emphysema was present in the tissues of the neck, cheek, and thoracic wall—probably of some duration, as the fibres of the muscles were well outlined. The hilar glands were enlarged and there was a general increase in striae, indicating congestive and catarrhal changes. In the right midzone, at the level of the third right rib, there was an indefinite opacity, situated in the lung parenchyma.

Oct. 16.—The surgical emphysema had cleared completely. The hilar shadows and the striae had increased in extent, especially in the left upper zone. In the right midzone there was what looked like a definite cavity. In the opaque area previously noticed there were now two semi-translucent areas.

Oct. 30.—The hilar shadows were as before, and the striae had increased in extent. In the right midzone there were what now seemed to be three cavities. In the left zone there appeared to be two large cavities overlapping. In the left midzone there seemed to be a cavity, and a possible one at the left base. The lateral view showed these cavities rather well.

Nov. 13.—The cavities in the right midzone were clearing. The cavity in the right upper zone was more distinct. The cavities in the left upper and midzones were also clearing. At the left base the cavity was more delineated. Striae had decreased, but the hilar shadows were still enlarged.

Dec. 29.—Only a trace of the cavities remained on the right side and left upper zone. The hilar glands were still enlarged and the striae still prominent.

Feb. 27, 1942.—The cavities had disappeared except in the left upper zone and base, where there was just a faint trace of them.

Discussion

The occurrence of hemiplegia in the course of whooping-cough, although rare, is a recognized phenomenon. In the largest series of cases, collected over a lengthy period, hemiplegia occurred in about 50% of the cases showing neurological complications (convulsions not being included as such by the authors concerned). The hemiplegia may be transient, permanent, or associated with high mortality, particularly in the left-side paralyses (Valentin, 1901-2). The subject is reviewed by Gordon Sears (1929) and Nelson (1939).

Though we were familiar with this particular complication, our patient presented us with a diagnostic problem which still remains unsolved, though a speculative attempt has been made. There is no general agreement as to the aetiology of neurological phenomena in pertussis even when post-mortem material is available. When it is not, there is a much larger field for speculation. Perhaps the commonest tendency nowadays is to ascribe most of the neurological complications of whooping-cough, as indeed of most of the acute specific fevers, to an "encephalitis." This diagnosis, undoubtedly true in many cases, cannot be universally applied, and often rests on insecure pathological findings (Kinnier Wilson, 1941). Very often also there is a paucity of such positive findings in the cerebrospinal fluid as would tend to confirm the presence of encephalitis.

The occurrence of focal intracranial haemorrhage, and more particularly of local functional disturbances of vascular supply as shown by Hiller and Grinker (1930), cannot be excluded. Brain (1940) holds that focal symptoms are probably the result of focal vascular lesions and softening.

Neubuerger (1925) advances the view, based on comparative pathological studies, that the lesions found in certain cases of whooping-cough eclampsia are strictly comparable to those produced by air embolism. The histopathology described is typical of an ischaemic necrosis; this is strikingly confirmed by the recent work of Dorothy Russell (1941). She describes the histological features of the results of fat embolism in the brains examined by her and, referring to the work of Neubuerger, confirms his findings in air and fat embolism. For the histological picture presented reference should be made to the original papers by Husler and Spatz (1924), Neubuerger (1925, 1926), Spielmeyer (1928), and Dorothy Russell (1941). Neubuerger (1925) gives very cogent reasons for the occurrence of air emboli in whooping-cough. In two of his cases the cerebral histology was identical with that found in a case of air embolism following induced abortion, in which the embolus passed to the cerebral circulation by way of a widely patent foramen ovale. Already in 1913 Spielmeyer had obtained similar results in experimental animals.

In our case there was very marked evidence of a ruptured alveolus—a severe grade of subcutaneous emphysema which presumably originated from an acute interstitial emphysema tracking up to the neck by way of the posterior mediastinum. Furthermore, the radiological appearances are in support of the occurrence of acute emphysematous bullae. The round translucencies, distributed in a multiple fashion, appearing and disappearing quickly, and healing without fibrosis, are unlike any other lesion causing cavitation. The disappearance of the bullae may be due to rupture. Probably, therefore, volumes of air may have been liberated into the circulation at any time throughout the period of formation of these areas of parenchymatous emphysema.

It therefore seemed reasonable to correlate the phenomena. Convulsions were attributable to the early ischaemic phase, and the hemiplegia resulted from infarction of the motor area by means of the emboli. The recent finding of marked right

cortical atrophy on encephalography would certainly favour a vascular lesion and exclude encephalitis.

To speculate on the occurrence of air embolism in other cases of whooping-cough complicated by convulsions, pareses, amaurosis, etc., both in those which recover and in those which are permanent, does not seem to us to be far-fetched. Small emboli may produce ischaemic effects which result in transient symptoms, and are comparable to the transient effects seen in the milder cases of caisson disease or in the pilots of rapidly climbing aircraft (Armstrong, 1939). Larger and more numerous emboli may produce permanent lesions by means of the focal infarctions which result, as in the more serious effects of caisson disease. We would suggest that the diagnosis of air embolism be more frequently entertained in cases of neurological complications of whooping-cough, particularly those which follow severe spasms of coughing and are likely to be associated with a ruptured alveolus; furthermore, that the diagnosis of encephalitis be reserved for cases in which the spinal fluid shows some evidence of inflammatory change or the cerebral histopathology is undoubtedly encephalitic.

Summary

A case of whooping-cough complicated by hemiplegia is presented.

An interesting feature of the case was the occurrence of severe subcutaneous emphysema some days before the onset of the hemiplegia.

The two phenomena are correlated, and the hemiplegia is considered to be possibly due to air embolism.

A brief summary of the literature is given.

We should like to express our thanks to Dr. Norman Begg, medical superintendent of the Eastern Hospital, for his encouragement and critical help with this case; to Dr. T. V. L. Crichlow of the Middlesex Hospital for his advice as to radiological findings; and to the Medical Officer of Health to the London County Council for permission to publish.

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Medical Memoranda

Anaphylactic Shock after First Injection of Tetanus Serum

The following case of anaphylactic shock may be considered of enough interest to be placed on record.

CASE HISTORY

T. B., a 19½-year-old medical student, bruised his right leg just above the tuberosity of the tibia on April 15, 1943. The next day, at 9.20 p.m., antitetanus serum was administered subcutaneously. The serum was made early in the war by the Lister Institute, and no similar reaction after its use has been reported to them since the batch was issued. Twelve years ago the subject had an anti-scarlatinal injection. He has never had asthma, or any other similar disease, and there is no history of asthma in the family. He has never shown any signs of urticaria.

Having only a 1-c.cm. sterilized syringe at hand, the serum was given in two stages, with about half a minute interval. About five minutes later the first signs of allergy appeared, laryngeal constriction was felt, and there was itching over the whole body. Having realized that an anaphylactic shock had started, some adrenaline was called for. Meanwhile other symptoms developed—vomiting, desire to pass water, inability to sit up, and a bottle given to the patient fell from his hand. The pulse rate was 120 and very weak, sometimes imperceptible. The lips and finger-nails were cyanosed, great difficulty was experienced in breathing, and heavy pains were felt round the xiphisternum and angle of Louis.

Three ampoules of adrenaline 1/10,000 (a higher concentration was not available) brought temporary improvement; cyanosis remained, the blood pressure fell shortly afterwards again, and the patient vomited for the second time. As no more adrenaline was available it was imperative to arrange for removal to hospital. On arrival 1 c.cm. of adrenaline 1/1000 was given. The pulse improved, and the blood pressure was 100/70. The condition was satisfactory at 2 a.m., five hours after the serum had been given, but the patient was restless the whole night. There was enough improvement during the following day for him to be discharged from hospital, but he remained under my observation. Progress was as follows:

April 19 (two days after discharge from hospital): pulse rate 56, temperature normal; pains in joints; veganin given with effect. April 20: pulse rate 60, temperature normal: parotid, submaxillary, and sublingual glands became swollen. April 21: pulse rate 120, temperature 99° in the morning and 101.5° in the afternoon; glands increased in size, and the site of the serum injection inflamed. April 22: temperature 99°; swelling of glands disappeared; more urticaria; swelling of arm increased and more painful. April 23: return to normal.

The antitetanus serum, made by the Lister Institute during the early part of the war, was not used before April 16, 1943.

Dorking County Hospital. K. BRANDL, M.D.

Sulphapyridine Anuria successfully Treated by Ureteric Catheterization

The case reported below suggests the advisability of the following measures during sulphapyridine therapy: ample fluid intake to prevent concentration of the drug in the renal tubules; daily measurement of urinary output; daily examination of urine for the presence of excess erythrocytes (ideally), or, alternatively, daily chemical tests for blood in urine. Estimation of urinary output alone, without examination for red cells, may be misleading, as for three days the patient neither complained of pain nor showed any gross diminution in output, although one ureter was completely occluded. It is worth while noting that in this case the mechanical obstruction was at the lower ends of the ureters.

The following treatment is suggested. Haematuria, renal colic, or diminution in urinary output during sulphapyridine therapy calls for cystoscopy—first for diagnosis, and secondly for any necessary treatment; immediate clearance of one ureter only may be possible at first, but this may facilitate a later clearance of the other. Intravenous drip therapy in anuria is indicated only when it is certain that at least one ureter is functioning satisfactorily; irremovable bilateral ureteric blockage necessitates nephrostomy.

CASE HISTORY

The patient, a woman aged 26, was admitted to hospital on Feb. 19, 1943, with lobar pneumonia. She was given 2 g. of sulphapyridine on admission, 2 g. after four hours, and 1 g. four-hourly until Feb. 22, when the dose was reduced to 0.5 g. four-hourly, this dosage being maintained until the 24th. She had not had any sulphapyridine before admission, and while in hospital had received a total of 24 g.

Her progress was uneventful until Feb. 24, when she developed severe right renal colic, started to vomit, and was restless and depressed. Her urine at this stage contained a large number of red cells, and the sulphapyridine was consequently discontinued. She was kept under observation until the following morning, when it was found that her urinary output for the preceding 24 hours totalled only 2 oz., the urine was heavily blood-stained, her blood pressure had risen from 120/80 to 160/100, blood urea was 156 mg. per 100 c.cm., and she was vomiting fairly copiously. No urine was obtained on catheterization, and she complained of a continuous aching pain in her right loin. An intravenous sodium sulphate drip was begun, and she was cystoscoped.

Cystoscopy showed a normal bladder. The left ureteric orifice appeared normal, but no urine was seen coming from it. A ureteric catheter was introduced without difficulty, some blood-stained jelly-like material being dislodged from the lower end of the ureter in the process, whereupon urine immediately flowed from this ureter, both through and around the catheter. Protruding from the right ureteric orifice was a small blood-clot, completely obstructing the ureter, and attempts to pass a catheter into this ureter were unsuccessful, apparently owing to the obstruction offered by the clot. As the left ureter was functioning satisfactorily the patient was returned to bed for further observation, with the ureteric catheter in position.

On Feb. 26 she was passing urine in normal quantity, both through the catheter and per urethram, and consequently the intravenous drip was discontinued and the ureteric catheter removed. During the following three days the output of urine continued to be normal, and the haematuria gradually diminished. On March 1 she had another attack of right renal colic, and a further cystoscopy was performed with the intention of clearing the obstruction in the right ureter. This was done without difficulty, the obstructing substance being located in the last 2 in. of the ureter, and consisting of blood-clot only. Before the cystoscope was removed from the bladder it was ascertained that both ureters were functioning satisfactorily.

Thereafter the patient made an uninterrupted recovery, the haematuria ceased, her blood pressure and blood urea returned to normal, and intravenous urography on March 15 showed that both kidneys and ureters were functioning satisfactorily.

I wish to thank Dr A. P. M. Page, medical superintendent, for permission to publish this case and for his advice and help; and also Mr. T. M. J. d'Offay, who carried out the surgical procedures.

J. P. CUNNIFFE, M.B.,
City General Hospital, Leicester. Resident Medical Officer.

Reviews

VARRIER-JONES'S PAPERS

Papers of a Pioneer—Sir Pendrill Varrier-Jones. Collected by Peter Fraser. Preface by Lord Horder. Introduction by Sir Humphry Rolleston. (Pp. 107. 6s.) London: Hutchinson and Co. Ltd.

Varrier-Jones's busy and active life left him little leisure for writing books. In collaboration with Sir German Sims Woodhead he published in 1920 *Industrial Colonies and Village Settlements for the Consumptive* and in 1925 *Papworth: Administrative and Economic Problems in Tuberculosis.* These slender volumes only chronicle the early days of his great experiment and the principles upon which it was based. It was his intention, we know, to write the full story in the days of leisure to which, like many other workers, he looked forward. Fate willed otherwise, but the loss has not proved irreparable. Scattered through medical journals, monthly reviews, and periodicals both British and foreign are to be found eighty-three lectures, addresses, and papers written by Varrier-Jones and dealing with many aspects of tuberculosis. It has been a labour of love to Mr. Peter Fraser, Sir Pendrill's literary executor, to collate these papers and in five chapters to weave the substance of them into a connected narrative which gives the teaching of Varrier-Jones in his own words.

Passing from a review of the tuberculosis problem, the elusive character of the early case is next described. Here there is a pithy comment on *x*-ray diagnosis worth quoting in view of the present-day boom in mass radiography.

> "When we take an *x*-ray film we are filled with wonder at the complications of nodes and shadows, not sufficiently realizing that what we are gazing at is the picture of past battles, filled-in trenches, exploded mine-craters and the like. What we imagine we see, but do not, is the advancing army of disease."

A chapter on late diagnosis follows, and this contains warnings against repetition of the disastrous and costly experiment of training colonies, which was tried after the last war, and the myth of "a light job in the open air" for the consumptive. Chapter IV is entitled "Summing up the Situation," and begins: "The medical profession does not fully appreciate that there can be no other criterion of a patient's 'cure' or of the arrest of his disease than that of earning capacity, more or less permanent." This leads up to the final chapter, which gives an account of "The Great Endeavour: Papworth." Here it is shown how Varrier-Jones succeeded by employing every possible agency—medical, environmental, social, and industrial—to ameliorate the lot of the consumptive and, above all, in the words of Sir Clifford Allbutt, "to give him hope." In the Appendix the first Varrier-Jones Memorial Lecture, by Wing Cmdr. Trail, is reprinted.

This little book forms a worthy tribute to the memory of Pendrill Varrier-Jones. It will interest all those who are concerned with anti-tuberculosis work. As Lord Horder observes in his eloquent preface, "We owe Mr. Peter Fraser a great debt of gratitude."

A. S. MACN.

GENERAL THERAPEUTICS

The 1942 Year Book of General Therapeutics. Edited by Oscar W. Bethea, Ph.M., M.D., F.A.C.P. (Pp. 512. 19s.) Chicago: The Year Book Publishers; London: H. K. Lewis and Co.

This yearbook continues its useful career. Naturally considerable space is devoted to the sulphonamide group, and sulphathiazole is recommended for infective mononucleosis, though care must be taken to avoid leucopenia of the neutrophils, by repeated blood counts. Properly used it shortens the duration of the disease remarkably. Sulphadiazine combined with hyperthermy induced by T.A.B. vaccine has been recommended as the best treatment for bacterial endocarditis, but the editor adds a pointed footnote to the effect that in this disease so many clinicians have observed one cure and no more! The uses of vitamin K, either as such or a synthetic equivalent, are discussed, and stress is laid on its usefulness as a preventive of neonatal haemorrhage if given to the mother for two weeks preceding delivery. As an anticoagulant, on the other hand, dicoumarin is recommended where heparin is thought to be risky. It is interesting to know that after removal of 500 c.cm. of blood it requires 49.6 days before the haemoglobin of the donor returns to its previous level—a fact which should be borne in mind in these days of urgent demand for blood donors. A word of caution is uttered against the too rapid warming of a burned patient, for this may lead to such peripheral vasodilatation as to induce collapse. The advantages of interrupted over continuous stilboestrol therapy are expounded and explained. The value of injecting pitressin tannate in oil for diabetes insipidus is becoming generally recognized, but it is often not realized that its effect is cumulative, so that the dose should be gradually diminished from the initial one of 1 c.cm.; no mention, however, is made of the fact that this is really a fine suspension and not a solution, so that in order to obtain consistent results the mixture should be well shaken before filling the syringe. Picrotoxin is extolled as an antidote to barbiturate poisoning. These are but a few of the helpful suggestions on treatment contained in this useful annual.

WHOLESOME WATER

The Examination of Waters and Water Supplies (Thresh, Beale and Suckling). By Ernest Victor Suckling, M.B., B.S., D.P.H. Fifth edition. (Pp. 849; illustrated. £3.) London: J. and A. Churchill. 1943.

The growing demand for water to meet the requirements of housing and industry, the increasing resort to rivers when underground sources fail, the occurrence in our midst of outbreaks of water-borne disease—all these at the present day signalize the importance of exercising every known precaution with a view to maintaining the highest possible grade of purity in our water supplies. To this end the timely production by Dr. E. V. Suckling of the fifth edition of an admired work on water chemistry and bacteriology will be cordially appreciated by all who share in the responsible task of turning out a wholesome water for the public use.

The eight parts of the book cover geological sources, water-works inspections, uses of waters, examination results, analytical processes, analyses in relation to geological origins with 79 examples, bacteriology, and purification. *B. coli*, it is stated, far outweighs in importance any other organism figuring in water bacteriology. It should never be ignored, and public supplies in respect of it, should be above suspicion. An interesting chapter advances reasons for the well-known difficulty of recovering such organisms as *B. typhosus* from waters whose infective power is beyond question. Notice is taken of the paratyphoid fever outbreak at Epping in 1931, the bacteria of which found their way into Cobbins Brook. The water-borne typhoid fever at Croydon in 1937 is the subject of a careful discussion, which ends with the caution that the manner in which the infective bacteria passed from the carrier to the well remains "a matter of conjecture." The book concludes with an account of the management of swimming-bath waters.

These few references can convey only a faint impression of the wide range and detailed precision of this valuable book. It appeals to the mind as fully informative upon the subject with which it deals, and in this and other respects sustains the high standard of merit set by earlier editions.

FRACTURES AND DISLOCATIONS

Fractures and Dislocations. By Various Authors. Edited by Sir Humphry Rolleston, M.D., F.R.C.P., and Alan Moncrieff, M.D., F.R.C.P. "The Practitioner" Booklets. (Pp. 104. 7s. 6d.) Eyre and Spottiswoode.

This small book consists of eight papers on fractures and dislocations, introduced by a short editorial preface in which we are told that all the papers have appeared in the *Practitioner* since 1933, six of them in a symposium on the subject published in June, 1940. Revision, however, has been radical and there are new illustrations. There is a detailed index, and the whole forms a valuable little book of convenient size. Our chief criticism is that the rather specialized outlook of some of the contributors has in some cases tended to give rise to statements with which many surgeons and practitioners will not only not agree but be at complete variance. To take an example: few general surgeons, probably few urologists even would subscribe to the statement (p. 10) that if a catheter cannot be passed in a case of rupture of the urethra complicating a fractured pelvis, drainage of the bladder must be secured through a perineal opening. Geoffrey Jefferson's article on the treatment of spinal injuries is excellent, but we can-

agree with his concluding statement that suprapubic cystotomy is no longer advisable where there are cord involvement and urinary retention. Our belief is that high suprapubic drainage, established early, with the avoidance of urethral catheterization, is the most effective means of preventing urinary complications. This conclusion was reached in the last war and has been re-established in this one.

But for being at variance with a few statements such as these, however, we were attracted by this little book and found it easily readable, modern, and very practical.

Notes on Books

Newspaper reports of the United Nations' Food Conference at Hot Springs Virginia, may lend a mildly topical interest to the sumptuous book *The Springs of Virginia, 1775–1900*, by PERCEVAL RENIERS, published by the University of North Carolina Press, and in this country by the Oxford University Press at 24s. There is a region of Virginia which abounds in mineral waters, and by the 1830's, after more than half a century of trial and error, the Southerner had evolved his method of taking them in the course of the Springs Tour. In the centre of this region of watering places lay the inner group, the fountains most strongly impregnated with minerals, heat, fashion, and fame—the Warm, the Hot, the White Sulphur, the Sweet, and so on. During his tour the invalid would consume in six weeks about 26 gallons of variegated mineral water. As at Bath and the Continental spas of Europe, ample provision was made for the amusement of those who came for pleasure more than for health. The Virginian springs have had their ups and downs, and to-day only two survive as going concerns—the White Sulphur and the Hot, both modern spas equipped to cope with modern demands. The story is told discursively, and there are many quaint contemporary drawings to set off the author's lively text.

With its senior counterpart on *Surgical Anatomy*, TREVES's little work *The Student's Handbook of Surgical Operations* may be said to have become a classic, and a popular one at that. The former is now sixty years old, the latter just over fifty. Revision by Surgeon Rear-Admiral Wakeley to produce the seventh edition of the operative surgery, however, has been somewhat uneven. Large illustrations of medullary tractotomy, retrogasserian rhizotomy, and of laminectomies for spinal tumours appear somewhat out of place in a students' handbook, in which those showing exposure of the main vessels and nerves are, in some instances, so small as to be rather difficult to interpret and thus to merit redrawing. Fig. 247 on page 522 is from a well-known standard work on operative surgery, but acknowledgment of the source has, by an oversight, not been made. Plugging of the superior longitudinal sinus with gauze, as advocated on page 481, is not to be recommended, and the use of pieces of muscle to arrest venous haemorrhage should be mentioned. For the next edition we should like to see still further revisions of this convenient and invaluable little book, for which we have long had great regard. The publishers are Cassell and Co., and the price is 12s. 6d.

The official *Medical Register* for 1943 has been published on behalf of the General Medical Council by Constable and Co. (Orange Street, W.C.2) at 21s., post free 22s. The table printed in the introductory section shows that 3,556 names were added last year. New registrations numbered 1,663 in England, 593 in Scotland, 381 in Ireland, 206 on the colonial register, and 713 on the foreign register. The total number of names on the *Register* at the end of last year was 69,428, being 2,436 more than on December 31, 1941.

Preparations and Appliances

A NEW WALKING IRON FOR SHORT LEG PLASTERS

Major T. T. STAMM, F.R.C.S., R.A.M.C., writes:

The appliance shown in the accompanying sketches consists of a wooden sole plate to the under-surface of which is riveted a metal rocker made of strip steel, fitted with a tread made from scrap belting.

The sole plate is made from 3/8-in. wood or ply, cut to approximately the shape of the foot, and of sufficient length to extend from the back of the heel to the tips of the toes, as shown in Fig. 1. The rocker is moulded from strip steel about 1/8 in. thick and 1½ in. wide to the shape shown in Fig. 2. It is either bolted or riveted to the under-surface of the sole plate. Since the exact size of the metal used does not matter, provided that it has sufficient rigidity, it can be manufactured from odd lengths of scrap steel. The tread, which should be approximately the same width as the rocker, is made from odd lengths of fibre or leather belting, and is riveted to the under-surface of the rocker.

Technique of Application.—It is one of the advantages of this appliance that it permits a much simpler and more certain technique to be used in applying the plaster cast. The appliance is placed on the stand shown in Fig. 3. The stand consists of two wooden uprights shaped as shown and screwed to a base board, leaving a gap between them wide enough to accommodate the rocker. The sole plate thus rests horizontally on the four corners of the uprights. The gaps in the sides of the uprights permit the plaster bandages to be passed through under the sole plate so as to incorporate it in the cast. The patient sits on a chair with the leg hanging vertical. To obviate backache in the operator, the chair is best placed on top of a table. A posterior plaster slab is applied to the leg, and the patient's foot is then placed in its correct position on the sole plate as shown in Fig. 4. The plaster slab is carefully moulded to the leg and especially to the sides of the foot and heel. Circular turns of plaster bandage are now applied to complete the plaster, incorporating both slab and sole plate. It is essential to ensure that the patient's knee remains vertically above the ankle in both planes throughout the procedure. This automatically ensures that the foot is fixed at a right-angle to the leg and that it is neither everted nor inverted.

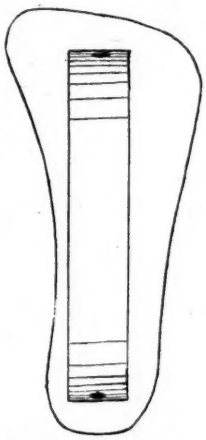

FIG. 1.—The appliance from below.

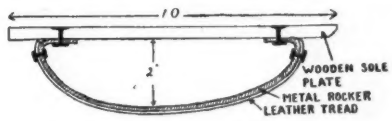

FIG. 2.—Side view of the appliance.

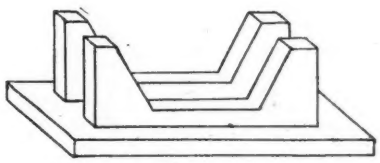

FIG. 3.—Stand for sole plate and rocker.

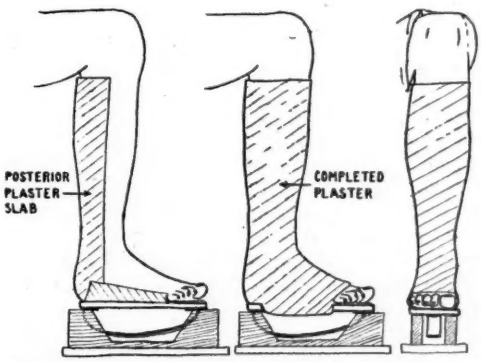

FIG. 4.—Showing method of applying the plaster cast.

The following advantages are claimed for the appliance and its method of application: (1) The whole apparatus can be made cheaply and easily from scrap materials, and only requires to be fitted with a new tread before it is used again. It is thus very economical in materials. (2) It ensures a natural heel-toe action in walking and avoids the external rotation effect adopted by most patients with other forms of walking plasters. (3) It is comfortable to walk on and gives the patient increased confidence. There is no danger of skidding. (4) When applied with the technique described above, it facilitates the application of the plaster and ensures a correct alignment of foot and ankle. No assistance is required to hold the limb, and the operator has both hands free to mould the limb or plaster at the fracture site, if necessary. (5) It greatly facilitates removal of the plaster, since the circular turns round the foot can be cut against the sole plate without danger or discomfort to the patient. The whole foot section is then easily removed. (6) It ensures that the plaster is kept dry and clean even in wet weather.

I am most grateful to the members of the staff of the Military Hospital, Davyhulme, who have helped me to develop the appliance, and in particular to Miss E. A. Phipps of the physiotherapy department and Mr. J. A. Bottoms, the hospital engineer

RESTORATION OF R.C.S. MUSEUM

The disaster which overtook the museum of the Royal College of Surgeons on the night of May 10, 1941, when nearly two-thirds of the specimens were destroyed, including the greater part of the Hunterian collection which was alike the nucleus and the inspiration of the museum, might well have induced in its guardians a feeling of despair. Much of this proudest possession of the College was irreplaceable, the cherished accumulation of more than one hundred years. But within a few weeks of the destruction the Council set up a new museum committee under the chairmanship of Prof. Grey Turner, and plans for a new museum, built upon the traditions of the old and around its survivals, have already been projected.

In some respects the new museum, if the lines of these recommendations are followed, will be different in scope from the old. Since the Hunterian and collegiate collections were first housed in Lincoln's Inn Fields every medical school has acquired its own museum. Moreover, national collections such as South Kensington have become available for students of comparative anatomy, zoology, and anthropology. The new museum will have the single purpose of illustrating the development, structure, and functions of man, and the diseases of which he is a victim, with the methods of investigating and treating them. Comparative anatomy will be retained and developed only in so far as its study throws light on the anatomy or function of the human body and its diseases; anthropology will also be retained, but great discrimination will be exercised in the development and display of these collections. From time to time the College acquires valuable collections by distinguished workers. These, of course, it is glad to receive, but such collections, if they are kept as a single entity, destroy to some extent museum symmetry—the museum tends to become a miscellany of specimens instead of a carefully arranged sequence. So far as the Hunterian collection is concerned, when that is restored—as it will be by the replacement of the destroyed specimens so far as possible and by making copies of models based on illustrations, records, or recollection—it will not be housed or exhibited by itself, but will be distributed among the various sections to which the specimens are appropriate.

Two Principal Divisions

It is recommended that the museum should consist of two principal divisions—anatomy and pathology—and, for the control of these, that the Council should establish chairs of human and comparative anatomy and of human and comparative pathology, with such endowments as would place them among the most attractive in the country. The co-ordination between these two main sections would be secured by the museum committee.

The committee has set to work to enlist the help of the leading teachers of anatomy in rebuilding the series of anatomical dissections, and, although anatomists at present have difficulty in obtaining suitable material and technical assistance, an encouraging response has already been made. The section of human anatomy, if these plans are approved, will be rebuilt in its entirety in order to display the structure of the body from every possible aspect and at all ages. It will comprise normal (including microscopic) anatomy, topographical and applied anatomy, the anatomy of approach (that is, the anatomy of the parts exposed in the course of surgical operations), embryology, and the anatomical changes that occur with the years.

The restoration of the pathological collections, it is thought, will be less difficult. An organized effort is being made for the systematic collection of material through selected members of the various Sections of the Royal Society of Medicine. The names and addresses of those who have thus made themselves responsible for the collection of specimens are as follows:

Surgery: Mr. R. H. O. B. Robinson, St. Thomas's Hospital, S.E.1.
Diseases of Stomach and Gall-bladder: Sir James Walton, London Hospital, E.1.
Diseases of Thyroid: Mr. Cecil A. Joll, Royal Free Hospital, W.C.1.
Proctology: Mr. L. E. C. Norbury and Mr. E. T. C. Milligan, both St. Mark's Hospital, City Road, E.C.1.
Urology: Mr. H. L. Attwater, All Saints' Hospital, Austral Street, S.E.11, and Mr. John Everidge, King's College Hospital, S.E.5.
Ophthalmology: Mr. A. J. B. Goldsmith, Royal London Ophthalmic Hospital, City Road, E.C.1, and Mr. Eugene Wolff, Royal Westminster Ophthalmic Hospital, High Holborn, W.C.1.
Oto-rhino-laryngology: Mr. V. E. Negus, King's College Hospital, S.E.5, and Mr. F. C. Ormerod, Westminster Hospital, S.W.1.
Gynaecology: Mr. Aleck W. Bourne, St. Mary's Hospital, W.2.
Paediatrics: Dr. A. W. Franklin, St. Bartholomew's Hospital at Hill End, St. Albans, and Dr. A. Gordon Signy, Staines Emergency Hospital, Ashford, Middlesex.
Pathology: Mr. R. W. Scarff, Middlesex Hospital, W.1.
Odontology: Mr. P. Buckley Sharp, 60, Portland Place, W.1.
Comparative Medicine: Dr. E. G. White, Research Institute in Animal Pathology, The Beeches, Streatley, Berks.

The general pathological series is to be restored to the fullest possible extent. Regional pathology, including dermatology, will be retained, but developed primarily for the expert, because the needs of the undergraduate are largely met by the museums of the teaching schools. Under morbid histology will be included a collection of typical histological preparations. There will be sections of military surgery, forensic medicine, and industrial diseases. A suggestion put forward for detailed consideration by the Council of the R.C.S. is the institution of a section of a general educational character for the public. The odontological section escaped destruction entirely, and will be developed, as will also the series representing conditions of the eye and of the ear, nose, and throat. The historical series will include Hunterian and post-Hunterian relics and an illustration of the evolution of modern surgical instruments. It is intended to have a section of *x*-ray films or lantern-slides of films, and also of exceptional cinematograph films of surgical conditions and operations, with a view to the possible future development of this form of recording.

Certain points of general policy have also been considered, especially the desirability of keeping clinicians in constant touch with the museum, the need for collaboration with other museum authorities, and arrangements for periodical special exhibits. There remains the problem of rebuilding either on the present site or somewhere in close proximity to the research laboratories and library, and that awaits events over which at present the College has no control.

FIRST AID IN AIR RAIDS

A largely attended conference was recently held in London under the auspices of the Citizens Guild for Civil Defence, an association comprising the personnel and officers of the various services which protect life and property during air attack. The general subject discussed was practical first aid and ambulance work in wartime. It had been announced that the chairman would be Col. H. R. Bateman, Deputy Director-General of Casualty Services, E.M.S., but it was stated that the Ministry of Home Security had asked him to withdraw lest his occupancy of the chair should imply official participation in a privately organized conference. In his absence Dr. W. Allen Daley, Medical Officer of Health, L.C.C., presided.

The differences between peacetime and wartime first aid were brought out pointedly by the opener of the discussion, Mr. H. Cotton, casualty service officer for Lincoln, who remarked that in peacetime the first-aid worker has to deal as a rule with only a single calamity, the injuries received are generally single, not multiple, and all the surrounding circumstances are helpful—for example, if the accident occurs at night there is abundance of artificial light. In wartime all these conditions are reversed. Some of the rules of first aid have to be reinterpreted. One principle which has sometimes to go by the board after air bombardment is that as quickly as possible the "casualty" must be removed from the cause or the cause from the "casualty." Another principle of first aid is that external haemorrhage must be attended to at once, but with people buried in the rubble of buildings suffocation may be a more imminent danger than death from bleeding. Even fractures may not be regarded as the injuries calling most peremptorily for attention. One officer stated that the combating of shock was more than half the first-aid worker's job. Rest for the injured person is necessary, and rest is largely a matter of correct posture. A principle universally agreed was that if medical aid is available at an "incident" the first-aid personnel should take advantage of it to the full; shifting on to the medical man the responsibility for the priority of cases to receive attention. In fact it was recognized that first aid in air raids should be minimal. If time is spent in unnecessary procedure the work is held up and a real disservice is done. The first-aid worker should not regard himself as treating anybody; his job is to attend to the case, and his modest ideal should be to deliver it to hospital or clearing station in at least as good a shape as it was just after the bomb had fallen.

The feeling was expressed at the conference that there should be a qualification for first-aid work under conditions of bombardment, that instructors who have had experience in raided areas should be sent to localities where there has been less opportunity for gaining such experience, and that a national casualty or rescue service should be organized.

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GAS GANGRENE

Gas gangrene caused a large mortality among casualties during the war of 1914-18, and early efforts were naturally made to deal with it more effectively in this one. Among these was the publication in 1940 of the M.R.C. War Memorandum No. 2, which has now appeared in a second edition[1] of double the previous size. Every section has been expanded, and it now contains a mass of information indispensable to anyone concerned in the treatment of war wounds. There is, in the first place, a clear and detailed description of what gas gangrene is and how it can be recognized. Gas bubbles seen in a skiagram do not constitute a diagnosis, nor does the presence of *Cl. welchii*, which indeed may be cultivated from a large proportion of contaminated recent wounds; mere gangrene itself is more often merely the result of loss of blood supply to an area of tissue bordering the wound. In gas gangrene there are rapid and extensive invasion of surrounding healthy tissue, particularly muscle; pain, swelling, marked constitutional signs; and, later, crepitus, skin discoloration, and a characteristic offensive smell. The diagnosis must be based on these signs, but a bacteriological examination of the wound discharge or of affected tissue may help in confirming the nature of the infection, even by the necessarily rapid method of the direct film.

Correct and early recognition is only a necessary prelude to effective treatment, and it is with treatment that the memorandum is mainly concerned. On the surgical side the technique of wound excision—the one form of preventive treatment the necessity of which is unquestioned—is described in somewhat greater detail; there is a more emphatic warning against primary suture, and a new one against completely closed or over-tight plasters. The other forms of treatment for which detailed instructions are given are the administration of antitoxin and sulphonamide chemotherapy. It must be admitted that we are not much nearer to an accurate assessment of the relative value of these measures or to decisions on how best to employ them than we were three years ago. In the Flanders campaign of 1940 systematic treatment was impossible, and records of such as was given were often lost. In the heavy air attack on our cities since then the circumstances in which cases of gas gangrene occurred in such numbers as to serve for systematic study were, of course, just those least suited for deliberate study.

The main theatre of land warfare in which we have been engaged is largely desert, in which anaerobic wound infection would not be expected to occur commonly. Gas gangrene has been encountered in Libya, but is stated to have been due mainly to *Cl. oedematiens*, an organism relatively insusceptible to sulphonamide treatment. There is experimental evidence that both sulphonamides and antitoxin will protect against this infection, either used singly or, still more effectively, if used together. In the absence of clinical evidence that either will serve alone, there is no alternative to recommending that both should be employed. It is accordingly recommended here that in any of five carefully specified types of case, each being one in which gas gangrene is particularly liable to occur, a prophylactic dose of polyvalent gas gangrene antitoxin should be given as well as local sulphonamide treatment. The dose of antitoxin advised is now much larger, containing 9,000 units *Cl. welchii* antitoxin, 4,500 units *Cl. septicum*, and 3,000 units *Cl. oedematiens*, and it is recommended that this should be given intravenously. Local sulphonamide treatment should usually consist in introducing either sulphanilamide or a mixture of sulphanilamide and sulphathiazole powder into the wound; it is also mentioned that the injection through a nozzle of a microcrystalline suspension of sulphathiazole may prove to be the best method for penetrating wounds, but this material is not yet generally available. For the treatment of established gas gangrene the measures advocated are "uncompromising excision of gangrenous and infected muscular tissue," or, if a whole limb or limb segment is involved, amputation, and full doses of both antitoxin and sulphonamides. The scheme of dosage for the latter provides for a seven-day course in slowly diminishing amounts; what matters in this acutest of all infective emergencies is the first forty-eight hours or even less, and in this period the doses recommended might well be exceeded. Whether the drastic surgical proceedings here still categorically enjoined are still necessary in spite of the advent of chemotherapy is open to dispute, and this is the most serious of the questions which further experience may be hoped to decide. The successful treatment of gas gangrene by sulphanilamide alone without radical excision was reported as long ago as 1937, and the possibilities of chemotherapy have not lessened with new compounds and greater experience in using them.

In a section on the need for further investigations it is acknowledged that the relative value of various treatments has yet to be assessed, and other subjects mentioned as worthy of study are the action of penicillin and proflavine—the prophylactic efficacy of which has now been demonstrated experimentally—the severe acidosis alleged many years ago by Wright to be produced by gas gangrene, and the clinical characteristics of infection by the different organisms concerned, as well as their response to treatment. The isolation and identification of *Clostridia* take too long to serve as an immediate guide to the conduct of the individual case, but if regularly carried out will furnish data indispensable in adjudicating on the effects of treatment and in framing future policy. The scheme for the bacteriological investigation of war wounds which concludes this memorandum has been largely amplified, and includes much up-to-date practical information indispensable to the laboratory worker; its scope actually extends well beyond the subject of anaerobic infections. By a combination of expert bacteriological study and careful clinical records, special forms for which are issued in the Army and the E.M.S., it is hoped that much further light may be thrown on this subject. The duty of contributing to it lies on everyone who has the opportunity of treating a case.

[1] *Notes on Gas Gangrene: Prevention, Diagnosis, Treatment.* H.M. Stationery Office. 1943. (6d.)

GATHERING WILD PLANTS

The pharmaceutical trade in Germany was among the first to be affected by the blockade. The effect, of course, was not felt throughout the range of raw materials, but it soon became serious enough to require strong counter-measures. The numerous synthetics were multiplied, but this did not meet the situation, and soon organized collections of wild plants were started throughout the Reich. In 1941 the German Press was full of references to the matter, and detailed official instructions were given to the Hitler Jugend what to gather. One such list includes leaves of foxglove,

blackberry, strawberry, raspberry, elderberry, coltsfoot, ivy, tansy, woodruff, pansy, thyme, nettles, pear, and rib grass; also flowers of the field poppy and the lime tree, and Iceland moss. In 1942 this collection was expanded, and, while details are clearly difficult to obtain, we can quote as an example that in Danzig and West Prussia youngsters were ordered to collect 1,000 kg. of lime flowers and 1,200 kg. of birch leaves, plus nettles, dandelions, red clover, and plantain. German pharmacologists were organized to investigate possibilities of obtaining new substances from locally available plants. By no means all the work has been published, but one was Simon's investigation on folinerin, a new glucoside from leaves of *Werii oleandri*, which resembles ouabain in its action, but is stated to be more effective. Similarly, a substitute for jalap resins was extracted from bindweed roots, though the amount collected in 1941 was inadequate to cover all the requirements.

With consistent German thoroughness the resources of occupied lands were tapped. School children throughout Estonia were made to gather important plants from the woods. Cultivation schemes were also started—for example, opium poppy planting in Denmark—and great hopes were held out for medicinal crops from the Ukraine. In the latter region even before the war there had been an increase in the land used for medicinal plants from 125,000 ha. to 290,000 ha. in 1936, and among the plants cultivated were large quantities of digitalis, belladonna, valerian, and mint. It is reported that immediately the Germans started to "reorganize the railways of Czechoslovakia" they planted briars along the railway embankments. The ostensible reason was to beautify the countryside: the real reason was that a large crop of rose hips for vitamin C would be available when war occurred. Huge quantities of rose hips were also obtained from Bulgaria, and the amount imported by the Germans in 1942 was ten times that imported in 1940. Other wild sources of vitamin C were exploited—for example, the bilberry and sea buckthorn, which has a very high yield (indeed the Wehrmacht requisitioned last year's harvest), while in the Eastern Territory spruce-needle decoction has been widely used as a source of ascorbic acid. As in the last war the Germans felt the agar shortage, and in January it was reported that the Veterinary Faculty of Berlin had elaborated a process for recovering agar from cultures. Last year some 40 substitutes for agar, gum arabic, and tragacanth were on the market, among which sodium cellulose glycolate seems to have been one of the best. This year it is reported that the Italians have produced agar from native seaweeds.

These random notes are but small pointers to the situation, and there is no doubt that German exploitation of wild sources of medicinal plants is as full as it can be. Certainly extensive use is made of the various organizations, such as the Hitler Jugend. In Britain we have not perhaps gone into this field so extensively, but the Vegetable Drugs Committee appointed by the Minister of Health about two and a half years ago has more than justified itself. County Herb Committees have been set up throughout the country with the assistance of the W.V.S., Women's Institutes, Boy Scouts, etc., and have collected large amounts of digitalis, belladonna, colchicum, male fern, dandelion roots, and several other plants of lesser importance. A large crop of nettles was gathered for a war purpose, and the success of the rose-hip campaign is familiar. Last year nearly one million bottles of a most palatable syrup rich in vitamin C were made, and snapped up by an appreciative public. A large crop of horse chestnuts was collected, in the main for the manufacture of glucose, but it also yielded valuable amounts of saponin, while the residue made useful cattle food. We, too, envisaged possible difficulties with agar supplies, and over two years ago investigations were quietly started which, having overcome many difficulties, have at last been crowned with success. The transition from laboratory scale manufacture to large-scale manufacture was, as is so often the case, far from simple, but intensive work by one of the pharmaceutical houses has overcome the snags, and we can now manufacture an agar as good as Kobe No. 1. The County Herb Committees are assisting in the collection of the special seaweeds this year. They are, of course, continuing with the other work, and the experiences gained in the previous two years, the provision of many more drying centres, and great improvements on the administrative side lead us to hope for an even greater harvest than in 1942.

THE FOOD SITUATION IN EUROPE

"This book attempts, by explaining all the technical terms used, to interpret the present nutritional state in Europe to the layman, but at the same time it sets out to provide a scientific and, as far as possible with such a heart-rending subject, an unemotional analysis of the situation." This opening sentence of the preface adequately describes the content of *Starvation in Europe*, by Geoffrey H. Bourne.[1] A chapter is devoted to the pre-war food situation in Europe. It is evident that information under this head is capable of supplying only very general indications. Statistical information regarding food imports is obtainable in most cases, but food production figures are in some countries not very reliable. Moreover, inequalities of distribution make it impossible to estimate, without detailed surveys, the extent of malnutrition in any given country. Scarcity and want were all too commonly experienced, even in lands of plenty, before the war. The author has made the most of such information as is available, and he arrives at the conclusion that few countries on the Continent of Europe had a sufficient standard of nutrition even before the war. With the exception of Germany and Denmark no country could afford a fall in the consumption level of foods. In Belgium and in many of the Central European countries a rise in the nutritional standard was essential.

The main part of the book is concerned with the present food situation in the occupied countries of Europe. Information is fragmentary, but with the help of the various provisional Allied Governments and from other sources the author has compiled what must be considered in the circumstances as a remarkably detailed account of the food consumed and the privations suffered by the enslaved populations. With the possible exception of Denmark, Great Britain is better fed than any other European country. In Greece, Croatia, the General Government of Poland, and parts of European Russia, both urban and rural populations are suffering from severe starvation. In Serbia, Belgium, and incorporated Poland both townspeople and peasants have insufficient food, but the peasants are better off than the urban populations. In France and in many parts of Norway the peasant populations have retained their pre-war consumption of food, but the urban populations suffer from serious deficiency. The Netherlands, the Baltic States, and the Protectorate (Bohemia and Moravia) are slightly better off than France and Norway, but the food available in the towns is below the amount and quality required for the preservation of good health. Finland, Bulgaria, Rumania, and Hungary are a little better off than France. Germany is only a little worse off than Denmark, but Italy is in but little better plight than Belgium. Over a large part

[1] George Allen and Unwin. (5s.)

of the Continent the peasant population is very little worse off as regards feeding than it was before the war.

Such a book as this makes sombre reading, but its contents are not gruesome enough to justify the title "Starvation in Europe" or the inclusion of four macabre illustrations depicting the corpses of persons dead of starvation, one of which disfigures the paper wrapper. If such illustrations were in any way typical of existing conditions in Europe, or more than ghastly examples of exceptional occurrences, Europe would be past saving. That is happily not the case. The book serves as a reminder that when hostilities cease the people of Great Britain may be called upon to continue the rationing of food, on which they thrive, until the pangs of hunger are stilled in Europe. In an epilogue the author gives his ideas of how relief should be accorded the liberated populations when the day of liberation dawns. He would have a "nutritionally well-informed person" at the head of relief-feeding shock troops, or else an expert organizer with a nutritional adviser at his side. No one like a Latin or Greek scholar should be appointed to such a post; it is essential that he should be in touch with scientific reality. In spite of the author's antipathy to Latin or Greek scholars in positions of administrative authority he closes his scientific treatise with a quotation from Homer's *Iliad*. In practice famine relief work frequently involves many complex administrative problems that even the most distinguished nutrition expert might find difficult to solve. Questions of post-war relief have received and are receiving detailed consideration by the Allied Governments, and nutrition experts have doubtless been called in council. In discussing post-war relief, writers in this country have a tendency to overlook or underestimate the scientific capacity of their European colleagues, many of whom, it may be hoped, will be available to help in the rehabilitation of their countrymen, with a fuller knowledge of their country's needs than any foreigner can possess. To write as if we had a monopoly of scientific erudition is apt to make us unpopular abroad.

FACTORS DAMAGING PANCREATIC ISLETS

During the past fifteen years Continental literature has contained scattered references to a relation between the parotid gland and carbohydrate metabolism. The evidence put forward was somewhat contradictory and did not excite much interest in this country or in the U.S.A. Last year, however, Birnkrant[1] claimed to have produced striking rises in blood sugar and changes in the structure of the islets of Langerhans in rats injected with extracts of beef parotid glands. The extracts were prepared by slight modifications of the method devised by Harrow and his colleagues[2] for the extraction of blood-sugar-raising substances from the urine of diabetics. Two of the extracts were relatively crude (1 g. approximately equivalent to 10 g. of original gland), while the third was crystalline (1 mg. equivalent to 4 g. of original gland). When these extracts were injected intraperitoneally into rats there was a significant increase in the blood sugar, rises of 60 to 80% appearing in one hour. These rises persisted for some time, initial values not being regained in some cases for 12 hours. Daily injections of these extracts led to a consistently raised blood sugar. The glucose tolerance of the injected rats was also changed, a diabetic type of curve being obtained with a higher and later peak and longer duration. In rats killed after 7 daily injections of these extracts degeneration of some proportion of the islets of Langerhans was observed, with granular or hydropic degeneration and infiltration with small round cells and fibroblasts; in some of the islets the normal cells were wholly replaced by fibroblasts. All these changes were brought about by injections of 50 to 100 mg. of the crude extracts or 5 mg. of the crystalline extract. No changes followed control injections of a beef extract broth. More recently Shaw Dunn, Sheehan, and McLetchie[3] have produced a specific necrosis of the islets of Langerhans by the intravenous injection of alloxan into rabbits. After the injection of 200 to 300 mg. per kg. the rabbits exhibited a rise in blood sugar (as high as 380 mg. per 100 c.cm.) in the first 1 to 2 hours, and a subsequent progressive hypoglycaemia ending in the death of the animal 12 to 48 hours after the injection. At necropsy varying degrees of necrosis were found in the pancreatic islets. The degree of necrosis depended on the time elapsing between injection and death, ranging from early changes such as the appearance of strongly eosinophil cytoplasm with pyknotic nuclei to late changes in which the nuclei had lost all basophil staining or in which the islets had almost completely disappeared.

It is probably too soon to speculate on the physiological significance of these results. Birnkrant suggests that the rise in blood sugar may be brought about by inhibition of glycogenesis while glycogenolysis proceeds normally. The degenerative changes in the islets may be a reaction to a specific cell toxin, or may be the end-results of an accelerated type of atrophy of disuse after prolonged inhibition of function. Shaw Dunn and his colleagues suggest that the early rise in blood sugar produced by alloxan causes an excessive production of insulin to such an extent that the islet cells may die of overstrain. Alternatively, alloxan, which is a constituent of uric acid, and as such is normally present in the body, may specifically stimulate insulin production. They point out that muscle is the main source of endogenous uric acid and the greatest sugar consumer in the body. It may be that alloxan or some related purine is discharged into the blood stream in amounts proportional to the degree of muscular activity, and that it plays some part in regulating the activity of the islets of Langerhans. Some such mechanism may explain the rapid regulation of the blood sugar which is maintained during the exercise. As one practical consequence of the discovery it should now be relatively easy to produce experimental diabetes in animals.

[1] *J. Lab. clin. Med.*, 1942, **27**, 510.
[2] *Proc. Soc. exp. Biol.*, N.Y., 1936, **34**, 688.

THE ROSS INSTITUTE OF TROPICAL HYGIENE

The part played by the Tropics in providing indispensable products of all kinds has never perhaps before been so forcibly brought to the notice of the public as now. Nor in this connexion has the importance of malaria and the need for controlling this most deadly of tropical diseases been so clearly demonstrated. Measures of control of malaria have now been developed in many parts of the world, but in none has progress in this respect been more conspicuous than in India. Particularly has the work of the Ross Institute of Tropical Hygiene (India Branch) in the Indian tea, jute, and mining industries been a striking example of such progress. We have previously drawn attention to the part played by the Institute in co-ordinating the resources of individual interests in these industries and in organizing and developing systematic research and active prosecution of measures throughout the many gardens, estates, and labour forces concerned. In the annual report for 1941-2[4] renewed evidence is given of the extent of these activities. Among contributors to the co-operative action initiated by the Institute are listed over twenty agents and companies controlling more than

[3] *Lancet*, 1943, **1**, 484.
[4] Report of the Committee of Control, Ross Institute of Tropical Hygiene, (India Branch), for the year ending July 31, 1942. Royal Exchange, Calcutta.

200 estates, with a total acreage of nearly half a million; extracts from reports by medical officers and others give evidence of the scale and beneficial results of the measures undertaken. In the account of the year's activities malaria control naturally takes first place, and some interesting facts are given of the result of antimalaria work on a number of estates. Methods of biological control have been widely made use of, because owing to their cheapness and permanent character such measures have largely eliminated the high recurrent cost of oiling schemes. There are now at least 4,000 miles of streams and drains on tea estates in which the breeding of *Anopheles minimus*, the chief malaria carrier in this region, has been controlled by the "dense shade" method, whilst the regular training and cleaning of streams and the institution of "flushing" devices and other antilarval operations have been widely extended.

Perhaps the most immediately interesting part of the report concerns the Branch's activities in relation to the military situation in India. The invasion of Burma by the Japanese has introduced many acute problems, not the least of these being malaria in the frontier districts and among refugees passing into India by this route from Burma. Dr. Ramsay, Principal of the India Branch, has with his great knowledge of the local malaria problems involved been able to give much help, at their request, to the military authorities. The Branch has also been able to forward the war effort by providing trained Indian malaria surveyors. About 600 Indians, many of whom have volunteered for service, have now been trained at Ross Institute training centres. Several British medical officers formerly employed by the tea industry are also now, as a result of training and experience in antimalaria work, rendering invaluable service as malariologists with the Army in different theatres of the war. The report notes the retirement for health reasons of Dr. David Manson, in whose laboratory at Cinnemara much research work has been carried out and over 200 malaria surveyors trained. Mention is also made of the very valuable results from the researches of Dr. Muirhead Thomson of the London School of Hygiene and Tropical Medicine upon the bionomics of the carrier species *A. minimus*, whose life history has been intensively investigated in the field.

GASTRIC FACTOR IN PELLAGRA

The aetiology of pellagra is still not fully understood, though it is generally accepted that a deficiency of nicotinic acid is the essential factor and that there are generally concurrent deficiencies of the other B vitamins as complications. The deficiency may be due to dietary factors, or to internal disorders, such as gastric or liver insufficiency, which result in faulty utilization of the vitamin. The importance of the gastric factor may be seen from the frequent finding of achlorhydria and anaemia in pellagrins. These facts prompted Sydenstricker and his collaborators to try the effect on their pellagra patients of gastric juice from healthy persons or from pigs, and also of certain pig-stomach preparations. The result was dramatic, and cure of the symptoms of pellagra was effected in a very short time, varying from 36 hours to a few days; a few of the patients died of sudden relapse after all pellagrous symptoms were cleared. Sydenstricker's observations have been confirmed by Spies, by Bandier,[1] and by Petri and his associates. The last-named claim to have cured human pellagra and a so-called pellagrous syndrome in gastrectomized dogs by means of gastric juice; but Sydenstricker criticizes their work on pellagra patients as inadequately controlled. In two later papers[2] the same group of workers reported that intravenous injections of nicotinic acid, aneurin, or riboflavin were ineffective in curing the syndrome of pellagra in pigs which had been deprived of their stomachs. Provided the pellagrous syndrome of their gastrectomized pigs can be accepted as a perfect analogy of human pellagra, these results may be taken as an additional evidence of the important role of the stomach in the aetiology of pellagra.

The question remains, What is the exact nature of the relation between the stomach and the prevention of pellagra? Petri and his colleagues believe that the stomach is concerned with the synthesis of the codehydrogenases (coenzymes I and II) from nicotinic acid as well as in the synthesis of cocarboxylase and yellow respiratory ferment from aneurin and riboflavin respectively. This hypothesis may for the time being be viewed with some reserve, as it apparently contradicts the findings of Martin, Thompson, and de Carvajal Farero[3] that intravenous injections of cozymase (coenzyme I) were ineffective in curing canine black-tongue, while administration of nicotinic acid, on the other hand, was effective. Sydenstricker holds the view that continued deprivation of the essential vitamin or vitamins leads to changes in the gastric mucosa, the liver, and the central nervous system. The gastric mucosa undergoes atrophy, with the result that it fails to produce digestive ferments and hydrochloric acid. Later the liver is involved, giving rise to fatty infiltration or degeneration, with loss of ability to synthesize a substance necessary for the prevention of pellagra. This substance he assumes to be nicotamide; but the assumption fails to explain wholly why nicotinic acid is an effective cure for pellagra. Neither does the theory explain why Sydenstricker's patients responded so rapidly to treatment with gastric juice, which could not have contained much nicotinic acid, while they were living on a pellagra-producing diet. Further investigations seem to be necessary in order to arrive at a clearer understanding of the role of the stomach in the aetiology of pellagra. Perhaps an alternative explanation may be found in the assumption that the gastric and hepatic dysfunctions are the result of a primary deficiency of the essential vitamin or vitamins, and that the symptoms of pellagra are the manifestations of the gastric and hepatic disorders. This would bring the closely related diseases sprue and pernicious anaemia into almost the same category, with the difference that in pernicious anaemia the primary cause may not be the vitamin deficiency but something else.

[1] *Acta med. scand.*, 1939, **101**, 496.
[2] Ibid., 1940, **103**, 584; **104**, 245.
[3] *Amer. J. diges. Dis.*, 1941, **8** 290.

CONTACT LENSES FOR FLYING DUTIES

Owing to publicity through the columns of the lay press, which has recently directed attention to contact lenses as an aid to flying in the R.A.F., it is thought that the position should be clarified so that ophthalmic surgeons prescribing these lenses, dispensing opticians manufacturing them, and patients hoping that by wearing contact lenses they can obtain entry into the Service for air-crew duties, may be made aware of the true situation. Contact lenses are used on certain rare occasions in the Royal Air Force for operational air-crew personnel of experience. The cases are specially selected, depending on their flying skill and experience. There has never been any idea of accepting personnel into the Service with visual acuity below R.A.F. standards but which can be fully corrected by contact lenses. It is not in the interests of the R.A.F. that this should be so, or that there should be any attempt by enthusiastic applicants to escape detection at medical boards in order to serve their country in the air. The intention may be highly creditable, but full flying efficiency is not best served in this manner.

Correspondence

Wise Planning

SIR,—Though one is able to agree with much, if not all, of Dr. R. E. Lucas's letter (June 19, p. 766), I fear that it might be used as a weapon by those who oppose planning, both in medicine and in the widest aspects of national life. Wise planning is the highest form of human activity (with the possible exception of the arts). Dr. Lucas has brought a case, not against social planning, but for the application of its principles to the whole field of human activity.

Should our social welfare plans (including education, of course) be, as in the past, restricted to aspects of work and the treatment and prevention of disease, they will fail, as medicine has failed, because of lack of vision of man as a unity of mind and body (as Dr. Lucas has shown). A man is not only a worker but has leisure too, the good use of which requires special education and special planning. We have before us our failure to adjust to peace conditions after the last war, and, opposed to this, the Russian success in building a new social life after the Revolution and wars of intervention. But with all the vast construction and reconstruction of their effort in the economic field, the Russians did not neglect the essential necessity of catering and educating for the leisure enjoyment of her people. This to me seems the greatest achievement of the Russian experiment. It is based on a true appreciation of the dignity and potentiality of the common man and a recognition of his right to happiness. And this, coupled with his sense of significance, security, and identity with the State, has caused, it would seem, in Russia a reduction of mental ills of the sort to which Dr. Lucas points. I am not one who sees only good in Russia; but here is a vast experiment in planning of human lives before us to examine and to learn from for our own good.—I am, etc.,

London, N.W.1. GEORGE PEGGE.

Refresher Courses for Service Medical Officers

SIR,—Many articles and much correspondence have appeared in your columns on post-war medical planning. There is one aspect, immediately post war, which has not received its merited publicity. I refer to the need for most, if not all, medical men with the three Services to take a refresher course covering the various branches of medical science before returning to civilian practice.

Medical practice in the Navy, Army, or R.A.F. has little application in ordinary general practice. Cases seen on sick parades or detained in sick quarters do not represent a fair average of those met with in civilian life. Neither the illness nor the sufferer (usually an otherwise fit adult male) approximates to what is seen in hospital or private practice. It is customary in the Services to move any patient who is unlikely to resume duty in about ten days to a hospital; thus every "interesting" case is lost to the station M.O., a praiseworthy economy in man-power in time of war, but yet another disappointment to the enthusiastic disciple of Aesculapius. The Services provide an excellent training in sanitation and hygiene, but these are hardly likely to be of practical use unless the M.O. intends taking up public health work after the war. A certain number have, perforce, to spend their whole time on medical administrative office work, and they never see a sick person from one week to another. The Service specialist meets with diseases and injuries in age groups which under peace conditions provide the least proportion of his work. He is not dealing with anyone under 18 years of age, rarely over 45, and his medical contact with the female sex is necessarily limited by the number of women in uniform.

My plea is that every Service M.O. should be given the opportunity of taking, say, a three-months refresher course in general medicine at one of the many teaching centres before he is demobilized. This course should constitute the last three months of his Service career, for demobilization before the course would, in many cases, give rise to great financial hardship. Now is the time for the B.M.A. to approach the appropriate Government and Service authorities to ensure that thousands of M.O.s who are out of touch with civil practice are not thrown on the long-suffering public when this war is won.—I am, etc.,

Pretoria. E. L. GRAFF, Flight-Lieut., R.A.F.V.R.

Diphtheria Immunization in Brisbane

SIR,—From time to time I have published figures in the *Journal* to show what immunization can accomplish in combating diphtheria in Brisbane. As I intend shortly to vacate my position of M.O.H. to the Brisbane City Council to return to private practice I would like to record the diphtheria figures for the five-year period 1938-42, during which an intensive immunization campaign was conducted by me in this city. In this five-year period 30,045 children were fully immunized. This rate of immunization, which averaged approximately 6,000 per annum, was in the period under review well in excess of the birth rate. Here are the figures for this period:

Population and Diphtheria Cases

	1938	1939	1940	1941	1942
Population ..	325,890	326,000	333,560	335,520	349,680
Cases	459	505	231	202	89

The occurrence of only 89 cases for 1942 is a phenomenally low incidence in a population of 349,680 people, and Brisbane, which now has about 80% of its susceptible child population immunized, is free from the possibility of a diphtheria epidemic; but this satisfactory state, and last year's record low figures, can be maintained only by keeping the same high percentage of the new young susceptibles immunized: at present this is being done.—I am, etc.,

Brisbane, Queensland. RALPH WEAVER.

Treatment with Tuberculin

SIR,—I am glad to see Dr. W. B. Martin's appreciation of tuberculin, when properly used, in the treatment of tuberculosis (June 12, p. 736). Many physicians tried using tuberculin and abandoned it, because, as I believe, they did not succeed in administering it properly. Dr. Martin describes this as a difficult art. But for over thirty years I have been giving tuberculin according to quite simple rules which have been published, and my assistants and myself and a number of doctors in County Down have had good results by following these rules.

Some County Down patients are treated in a sanatorium where the most up-to-date methods are used as skilfully as anywhere, I believe. Others are treated with tuberculin at our dispensaries. This gives me a standard of comparison; and so far I have had quite as good results from the latter as from the former. If and when some new form of treatment gives distinctly better results than I get with tuberculin, I shall be willing to scrap tuberculin; but not till then.—I am, etc.,

Belfast. JOHN R. GILLESPIE, Tuberculosis Medical Officer, County Down.

SIR,—I wish to add my endorsement to the letter written by Dr. W. B. Martin. Before the institution of the local tuberculosis dispensary I had a considerable number of cases under treatment with tuberculin; now, thirty years later, I too can say that the survivors, alive, well, and working, greatly outnumber those who died of phthisis, in a proportion perhaps approximating 8 to 1. I have continued to use tuberculin, and have never had any cause to distrust its efficacy, always subject to the proviso that the temperature must first be reduced by rest or other physical measures to at most a low degree of fever. But a course may last 18 months, with two injections weekly for most of the time, and the patient must be sufficiently intelligent and have the leisure to take his temperature regularly and have a day's rest if there be a reaction.

I do not claim that advanced cases can be cured, but they can often be put and kept on top of their disease and retain their working capacity for many years, even though the sputa be continuously positive. I have been impressed by the fact that some patients—even in the very early stages—have no

inherent resistance. The temperature does not fall whatever measures are taken, and in these cases tuberculin is useless—worse than useless. It adds fuel to the flames.—I am, etc.,

Coventry. W. FRASER ANNAND.

Shortened Puerperium

SIR,—Most of the letters on this subject, while expressing very definite views for or against, lack actual experience of shortened puerperium. For a period of nearly ten years I have encouraged some of my patients—those who wished to do so and in whom there was no contraindication—to get out of bed about the fifth day and out of the house on the tenth. Some have had an even shorter puerperium. For example, a primipara aged 40, after a twenty-two-hours labour, was in the garden on the fifth day and went back to London with her baby in a crowded train on the tenth day. She came again for her second confinement, and on this occasion was seen pushing a perambulator in the street on the fifth day.

In general, I think it fair to say that such complications as prolapse of the womb, cystocoele, and rectocoele are not made more frequent by the shortened puerperium, and I have never seen a thrombosis in one of these patients. These remarks are not statistically significant owing, first, to the small number of patients, and, secondly, to the fact that my patients who had the longer puerperium are not a comparable group, in that they tended to contain the less fit women; but I think it well to encourage those healthy mothers who wish to do so to get up early and to assure them that no harm will result.

In conclusion, may I suggest that Dr. Hutchins (June 19, p. 768) draws a rather peculiar lesson from the remainder of the animal kingdom. One would be rather puzzled as to what would happen to other mammals in the natural state were they to lie up for fourteen days or three weeks after each confinement.—I am, etc.,

Beaminster, Dorset. R. E. HOPE SIMPSON.

Cerebral Reaction to Antisyphilitic Therapy

SIR,—An annotation on cerebral reactions to antisyphilitic therapy (May 29, p. 671) suggests that mapharsen (arsenoxide) is more prone to cause encephalitis than the arsphenamines by the statement "that mapharsen, which is claimed to be generally so much less toxic than most of the arsphenamines, appears to be unduly so as regards this condition." All are agreed that post-arsenical encephalitis, as the annotation states, "is fortunately very rare." At St. Thomas's Hospital, so far as is known and with the orthodox methods of treatment, no fatal case of encephalitis has occurred in the venereal department since it opened twenty-five years ago, neither with the neoarsphenamines from 1917-36 nor with mapharsen (mapharside), the routine drug from 1936 to the present date. Fortunately, I have not yet seen a case of post-arsenical encephalitis at St. Thomas's Hospital, or at the Whitechapel Clinic, or in private practice.

With regard to mapharsen being more toxic than the arsphenamines, the annotator quoted Thomas *et al.* (1942) in support of this view, who reported 8 cases, 2 fatal, in a series of 764 treated with *massive dosage* of mapharsen. He failed, however, to make a comparison between the incidence of encephalitis with orthodox methods and that due to modern massive arsenotherapy, which has inevitably caused an increase in toxic accidents, or to compare the figures of encephalitis in cases treated by massive mapharsen with the incidence among those treated with massive neoarsphenamine therapy. So far as I am aware, the arsphenamines, being too toxic, have never been employed in massive arsenotherapy.

The annotator's assumption that mapharsen is unduly toxic as regards encephalitis is hardly supported by a study of the relevant figures. First, with regard to the usual methods of treatment. The U.S. Naval statistics of reactions to neoarsphenamine and to mapharsen, when given by orthodox methods to young, comparatively healthy males comparable as to age and sex, indicate that mapharsen is definitely the less toxic. Phelps (1929) records 13 deaths in the U.S. Navy from acute encephalitis following 167,422 injections of neoarsphenamine (1 in 12,880). Stephenson, Chambers, and Anderson (1940) record 16 deaths from the same cause in the same Service following 1,301,913 injections (1925-39) of neoarsphenamine (1 in 81,370), but there were no deaths with 121,689 injections (1935-9) of mapharsen. Ross refers to other similar figures (1943); he experienced 1 death from encephalitis in 1,200 cases treated in Liverpool with mapharside, among whom "the toxic reactions have been minimal." Although of no statistical significance, of the 5 encephalitic cases reported by Nelson, McGibbon, and Glyn-Hughes (1943) and by Halcrow (1943) in the same issue of the *Journal* as the annotation, whereas 4 occurred after neoarsphenamine, only 1 followed mapharside. It is noteworthy that this case coincidentally had a virus disease—lymphopathia venerea—and Ross's fatality also had the same double infection.

Secondly, with regard to massive arsenotherapy. A greater number of cases have been recorded after massive mapharsen than with massive neoarsphenamine, because the percentage of reactions with neoarsphenamine was so high that this drug had to be rapidly discarded for mapharsen—so rapidly that few figures exist of the reactions due to massive neoarsphenamine therapy. The comparable figures of Leifer, Chargin, and Hyman (1941) favour mapharsen rather than neoarsphenamine. Using the intensive intravenous drip method, cerebral symptoms occurred in 2 cases (1.8%), 1 being fatal, in the neoarsphenamine series of 111 cases, compared with 3 cases (0.9%), none of which was fatal, in the mapharsen series of 330 cases. Two of the 3 were mild, and 1 was rather severe but recovered. Elliott *et al.* (1941) had 5 deaths from encephalitis in the first 1,600 cases treated with mapharsen by massive dose therapy, a fatality rate of 0.31%, which dropped to 0.25% when 2,000 cases had been treated. With massive mapharsen the encephalitic mortality risk generally quoted is about 1 in 300 cases. By improved technique, however, Shaffer (1943) has reduced the rate to 1 in 430 cases.

With regard to the general question of the relative toxicity of neoarsphenamine and mapharsen, and with no special reference to encephalitis, at St. Thomas's Hospital from 1929-36, when neoarsphenamine was in vogue, 70,102 injections of arsenobenzene compounds were given: 8 deaths (1 in 8,762) were due to arsenical poisoning. In comparison, from 1936 to May 31, 1943, 45,781 (2,150 g.) injections of mapharside were given with a mortality, so far as can be traced, of 1 death from acute yellow atrophy. During five years, 1936-40, among the males 1 death (yellow atrophy) occurred in 20,467 injections of mapharside, compared with 5 deaths in 28,302 injections (1 in 5,660) of neoarsphenamine during the previous five-year period, 1931-5. In Stephenson's series (1940) previously mentioned there were 49 deaths from neoarsphenamine (1 in 26,570 injections), and the ratio of reactions was 1 to 1,345 injections compared with 1 to 5,531 injections of mapharsen in his series of 121,689 injections without a fatality. Levin and Keddie (1942) state that "the death rate is 1 to 67,332 injections of mapharsen (in a series of 269,326 injections). This is less than one-half the death rate from neoarsphenamine." They conclude: "A review of the literature shows that mapharsen is less toxic than neoarsphenamine."—I am, etc.,

London, W.1. T. ANWYL-DAVIES.

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Control of the Head Louse

SIR,—Prof. J. R. Busvine, in his letter to you (June 12, p. 734) on this subject, admits that there is a difference of opinion as to the absolute effectiveness of lethane. When failures have occurred he attributes these to variations in the thoroughness of application and the difficulty of wetting every nit with a small quantity of fluid. The amounts to use, officially advocated, are half to two drachms according to the amount of hair. In a recent Liverpool experiment 100 cases were treated with *three* drachms each, distributed as effectively as possible. After two weeks 20% of failures was recorded. At the same time another 100 cases were

similarly treated, but their hair was previously soaked with 2% hot lysol; no failures were recorded. Though the thiocyanates have been shown to kill nits in the laboratory, they have also been shown in a certain percentage of cases not to kill them in their normal environment.

Since my letter was published in your issue of May 22 two school medical officers have written to me entirely agreeing with my observations, and a city school medical officer's annual report has been received, in which he states with regard to experiments carried out with all three preparations: "The thirteen nurses are unanimous in describing the results as disappointing." My motive for writing is constructive, for I believe that lethane is a valuable discovery, but some modification in the method of treatment does appear to be necessary if it is not to be discredited.—I am, etc.,

Liverpool. R. GAMLIN.

The Diet in Diabetes

SIR,—Prof. R. H. Micks's article (May 15, p. 598) adds significant arguments for the rapidly gaining opinion that regulation of the diet in diabetes with a view to maintaining a normal blood sugar is unnecessary. Indubitably, young diabetics on insulin and uncontrolled diet may show marked glycosuria and still enjoy good health, remain in fine spirits, maintain their weight, and keep free from any symptoms of diabetes. Of course, uncontrolled diet with insulin should never be advocated to the large group of middle-aged men and women who may present the classic signs and symptoms of diabetes. These obese glycosuric patients are, with few exceptions, more than 30 years of age, and they require strict diet. After the weight of these patients has been reduced to normal or as near to normal as possible by simple underfeeding, they remain aglycosuric when they are placed on maintenance diets. There is an occasional exception to this rule, of course, and recurrence of the obesity is capable of reproducing the hyperglycaemia. Subsequent reduction of weight again corrects the disturbance in metabolism.

The old orthodox view that a normal level of blood sugar and a urine free from sugar were the absolute essentials for satisfactory therapy must stand revision. Now is the time for the criteria for the satisfactory treatment of diabetes mellitus to be re-evaluated. The patient's actual condition—by which is meant his weight, his ability to carry on, his well-being, and his psychic outlook—is a more important guide than the level of the blood sugar and the freedom of sugar from the urine. Hyperglycaemia and glycosuria do not mean poor control. The criteria which I shall enumerate are the only ones which signify satisfactory treatment: (1) maintenance of weight; (2) absence of ketone bodies in the urine; (3) freedom from symptoms of diabetes. Glysosuria is not only compatible with good therapy but also protects the patient from hypoglycaemic reactions.

In one respect I must criticize Prof. Micks's scheme of treatment. He states that insulin in solution is usually given in preference to insulin suspension, and that in most cases of severe diabetes in adults two injections daily are found to suffice, while in many children a third (evening) injection is required to prevent a morning ketosis. Prof. Micks, I am sure, will agree with me when I say that one of the benefits of an uncontrolled diet is the production in the patient of a state of social and economic usefulness, backed up by his freedom in the matter of food without the necessity for careful dietary measurements. But patients should be able to administer the insulin to themselves in the morning and then put the equipment (syringe and insulin) away until the following day. In this way they are not singled out as a group apart from their fellow men, and their habits of living approximate the normal ones. And this is where zinc-protamine-insulin is so useful. It is especially a great comfort to children in relieving them of multiple injections. For this reason alone the introduction of ZPI must be considered a notable achievement and one of the great advancements in medicine. When it is necessary to add soluble insulin to ZPI in severe diabetics only one injection need be given, as they can be given one after the other with the same syringe. More important than anything else is the fact that ZPI ensures the abolition of states of transient ketonaemia resulting from tissue breakdown; and the complete absence of ketosis throughout the 24 hours is a striking feature. Even during the period of hyperglycaemia and glycosuria after a meal there is no recurrence of ketonuria as judged by the sensitive nitroprusside test. Naturally, the diminution in the number of injections is greatly appreciated by the patient, and this drastic reduction in the daily number is most important if the patient is to regard himself as a normal being.

On the subject of the relation of diabetes and arteriosclerosis, I should like to comment on this from the historical point of view. During the early part of the insulin era and before many diabetic adults exhibited an abnormal elevation of blood pressure arteriosclerosis was appearing prematurely in children. In this connexion Joslin (*The Treatment of Diabetes Mellitus*, Lea and Febiger, Philadelphia, 1937) has stated that when diabetics were treated with high-fat diets radiological evidences of arteriosclerosis could be found in many juvenile diabetics, where the disease had lasted several years, but that since the introduction of high-carbohydrate diets arteriosclerosis is less frequently seen. In fact, some doubt was thrown on the value of insulin because of what use was it to save a child from dying of diabetes only to let it succumb at an early age to arteriosclerosis? The diets used in those days were high in fat content, deficient in carbohydrate and "protective" mineral and vitamin-containing foods. Before the use of higher-carbohydrate diets diabetic patients were not enjoying good health; followed closely they usually had some ketosis. There were definite signs of arteriosclerosis developing in children, and the blood pressure in adults often rose. Nowadays diabetic children show no evidence of arteriosclerosis, while in adults the evidence of hypertension is proportional to the age of the individual rather than the duration of the diabetes.

The view has been expressed that a high-carbohydrate low-fat diet tends to prevent or to delay the development of arteriosclerosis in the diabetic patient. A more reasonable view is that any evidence of prevention or of a delay in the development of arteriosclerosis in the diabetic patient treated with a high-carbohydrate low-fat diet would appear to be due to the adequate control of the diabetes rather than to the type of diet used in treatment. It is now certain that the higher-carbohydrate lower-fat diets have improved diabetic patients by restoring them to a more normal state of health. They have seemed to lower the incidence of arteriosclerosis.—I am, etc.,

Guy's Unit, E.M.S. GEORGE R. W. N. LUNTZ.

Single and Multiple Lung Tumours

SIR,—Request has been made for information regarding the number of lung tumours in each mouse with a tumour in the experiments which I have conducted with various dusts. As reported recently (*Journal*, Feb. 13, p. 179) certain dusts definitely increase the incidence of lung tumours in mice. As is well known, lung tumours in both mice and man sometimes appear to be multiple—that is, they seem to arise independently at several separate areas of the same lung. In the 17 dusting experiments recorded in the above paper the average number of lung tumours per mouse with a tumour was 2.4 for the dusted mice; compared with 1.9 for the controls. This is not a great average difference, but in some of the dusting experiments the number of tumours per mouse with a lung tumour was double that for the control, and the largest number of lung tumours in any one mouse was 17 for the dusted group and 9 for the control of the same experiment.

American workers have reported very great numbers of lung tumours in one mouse as the result sometimes of tarring the skin, or as the result sometimes of injection of carcinogenic agents into the veins. It is apparent from the dusting experiments that, although the dust may be present in equal quantity in many mice, it only increases the incidence of lung tumours in certain of these mice. Also, although the dust may be present in all parts of the lungs, the tumours arise only in certain areas of the lungs, indicating some special susceptibility of these areas.

The results with the dusts thus seem to point towards two necessary factors: (1) irritation (chemical mainly, but mechanical irritation cannot be excluded entirely); (2) susceptibility. A combination of the old theories of irritation (Virchow) and of embryonic remnants (Cohnheim) would fit the case as occurs

with certain dusts. At any rate, so far there is no evidence that either Bittner's milk factor or a virus is concerned with lung tumours in mice, whereas there is clear experimental evidence that heredity, age, the so-called carcinogenic agents, and some dusts do play important parts. Heredity and age appear to control the factor of susceptibility, while carcinogenic agents and certain dusts may supply the necessary chemical irritation.

Fuller details of the number of lung tumours per mouse will, it is hoped, be published later.—I am, etc.,

London, N.W.3. J. ARGYLL CAMPBELL.

Subcutaneous Ligature of Varicose Veins

SIR,—Major B. W. Goldstone's paper (June 19, p. 753) regarding the above subject calls for the consideration of certain facts. He hopes to replace injection treatment by this "surgical" measure. Statistics of the mortality of injection treatment as against surgical treatment are not in his favour. McPheeter in America reports a series of 53,000 cases of injection treatment with 7 deaths. Müller, Kilbourne, and Bernstein report a mortality rate varying from 0.4 to 1% in their respective series of cases. In other words, the best of the surgical records show a mortality more than ten times as great as when injection only is employed. Possibly the clot caused by the injection of a chemical sclerotic is firmer than the clot formed above the ligature placed on a varicose vein. It is recognized that the aseptic ligature of the saphenous vein and tributaries is a safe and efficient method of treatment in certain cases. Two essential conditions must be observed, however. First, the patient must be *ambulatory*, and, secondly, the ligature must be placed so *close* to the femoral vein that clotting does not occur above the ligature.

I am afraid Major Goldstone may run the risk of some cases of pulmonary embolism as his series grows in numbers.—I am, etc.,

R. R. FOOTE.

Excision of the Patella

SIR,—The memorandum by Capt. J. J. Murphy, A.M.S. (June 12, p. 725), on bilateral fracture of the patella is interesting in that the natural conclusion to be drawn is that excision is the correct treatment for all fractures of the patella with deformity. If removal of one patella gives the stronger knee, then in bilateral fractures both patellae should be removed, an operation which, in fact, has been performed on previous occasions. Of 30 cases reported by Friberg, 2 were double excisions of the patella (these cases were not all fractures). Here is a report of a case of mine seen 12 months after operation.

A man aged 42, a painter and decorator, fell off a ladder on June 13, 1942, and was that day admitted to the Gravesend Hospital with two fractured patellae. *X*-ray examination revealed that both bones were completely shattered with absolute disruption of the articular surface. Operation was performed on June 19, when a great deal of bruising with large haematomata were found in each knee. Both patellae were excised and the tendons sutured with silk. Apart from a small stitch abscess the patient made an uninterrupted recovery and left the ward on July 13, to be discharged from the fracture clinic and return to work on Oct. 9. I saw him again a few days ago. He is carrying out his work as a painter. The two knee-joints enjoy full movements both in extension and flexion with complete stability and considerable power in the quadriceps tendon.

—I am, etc.,

Gravesend Hospital. MAXWELL LANDAU, Surgeon i/c Fracture Clinic.

Direct Inguinal Hernia

SIR,—With reference to the unusual type of direct inguinal hernia recently described by Surg. Lieut. M. R. Ewing (May 15, p. 612) and Mr. R. A. C. Owen (May 29, p. 678), it may be of interest to place on record a bilateral example of this hernia which I dealt with a few days ago.

The patient, a male aged 50, complained of a swelling in each groin, which was first noticed 15 months ago after lifting a heavy weight. Despite the patient wearing a truss the swelling increased in size. A pre-operative diagnosis of direct inguinal hernia was made. At operation, on dividing the external oblique, a piriform fatty sac 4 cm. long was found to be lying above the cord, and this sac could be picked up without in any way disturbing the cord itself. On both sides the sac was seen to emerge through a small, well-defined hole in the transversalis fascia, and when opened would admit only the tip of the little finger. The deep epigastric vessels lay 1 cm. lateral to the neck of the sac. The fat-laden peritoneal sac was dissected clear, transfixed, and ligated at its neck and pushed back through the hole whence it emerged. The gap in the transversalis fascia was then closed with silk. As I had previously taken fascia from the thigh, the repair was completed after the method of Gallie.

This is the first time that I have come across a hernia of this type among over 600 cases of inguinal hernia in Service patients. Among these, however, were two cases of direct hernia which pierced the conjoint tendon.

My thanks are due to Prof. R. C. Alexander, Surgical Director, for permission to publish this case.—I am, etc.,

JAMES F. RILEY,
Resident Surgeon, Scottish E.M.S.

Thrombophlebitis following Scarlet Fever

SIR,—The publication in the *Journal* (May 29, p. 665) of a case of post-scarlatinal thrombophlebitis migrans by Dr. J. Vincent Bates and the rarity of the disease prompt me to send you an account of a case under my observation which you may find of interest. The most interesting point is the late onset of this complication.

A boy aged 9 was admitted to the Hendon Fever Hospital on Oct. 15, 1941, with an attack of scarlet fever of moderate intensity. The temperature was 100.4° F., the typical rash was present, and there was circumoral pallor. The temperature returned to normal in three days and peeling was evident on the 14th day. On Nov. 11 (the end of the 4th week of the disease) the patient complained of a sudden attack of pain in the right thigh. The temperature was 100° F., pulse 96, and the child looked very ill. A swelling was present over the extensor surface of the middle of the right thigh, which was very tender, indurated, and hot, but there was no discoloration. Movements of the hip, especially extension and abduction, were very painful. Sulphapyridine 1/2 g. was given four-hourly, but was withdrawn on Nov. 14 as it was ineffective. On Nov. 13 the temperature had returned to normal and the swelling and tenderness in the right thigh had almost subsided. During the day there appeared a hot, tender, and indurated swelling of the left adductor magnus in the region of the lower end of the belly. The child again looked very ill and the heart apex beat had moved to one fingerbreadth outside the nipple line. This again improved when on the morning of Nov. 19 the left foot and ankle were found to be swollen. At 8 p.m. the patient complained of intense pain in the left leg; when seen at 10 p.m. he was in agony. The temperature was 99° F., the pulse 140, and the heart again dilated. The whole of the left leg was cyanotic, oedematous, and almost twice the size of the right. Morphine 1/12 gr. was given and the leg was elevated. A blood culture taken that night grew *Staph. albus*. A blood count showed: R.B.C.'s, 3,230,000 per c.cm.; Hb, 60%; C.I., 0.9; W.B.C.'s, 24,000—polymorphs 78%, lymphocytes 20%, monocytes 2%. The swelling gradually subsided. On Nov. 22 induration and tenderness were only present along the course of the vascular bundle in the thigh. The condition cleared up completely and the patient left hospital perfectly fit a fortnight later.

—I am, etc.,

Wakefield. H. M. GOLDBERG.

Atropine Glaucoma

SIR,—Dr. J. E. Martin's paper on atropine glaucoma (May 22, p. 631) does well to emphasize the danger of what is so often taken to be a drug specific for any and all eye conditions. Atropine is therapeutically active but often dangerous, and is certainly not to be used indiscriminately. But it is unfortunate that Dr. Martin should have been led by his desire to explain in simple terms the mechanism of atropine glaucoma into a physiological discussion which is neither free from error nor calculated to help practitioners to avoid blinding their patients. It is not my intention to attempt such a treatise. Atropine should not be used except when its use is clearly indicated, and if a doctor has not a clear understanding of the pathology of the eye which he is treating then a short article will not be able to give it to him any more than it will help him to know from his fingers whether the tension of an eye he is examining is raised or normal. What is important is to realize that atropine is dangerous, and be accordingly cautious in prescribing it. Every ophthalmologist has seen eyes in which a practitioner has mistaken an acute glaucoma for an iritis and given a mydriatic; such things should not happen, but nothing but practical clinical ophthalmic training will prevent them.

The causation of glaucoma is a very large and complex subject, and Dr. Martin's discussion of it is both loose and insufficient. It would be more helpful to say simply that the

condition is one of an increase in intra-ocular pressure, which may be very small in degree, damaging the optic nerve at its emergence from the eyeball, with impairment or loss of vision consequent upon this damage. There are many different types of glaucoma, with corresponding causes and pathology, and some even demand the full use of atropine, which to most is disastrous.

From the statement on eserine it might be supposed that this drug lowers the pressure in any eye, but it is as well to realize that this action only occurs in glaucoma and that eserine actually raises the pressure in the normal eye. Nor is the change in size with age of the normal lens of importance in the aetiology of glaucoma, as distinct from the swelling of early cataract; the distinction between normal senile sclerosis and cataract must be drawn. And, finally, the condemnation of digital estimation of intra-ocular pressure and laudation of mechanical methods lead one to suppose an insufficient experience of the one and a lack of knowledge of the gross errors, both theoretical and practical, of the other. This is borne out by the reference to digital estimation through the tarsal plate; the correct technique involves no such manœuvre.—I am, etc.,

Royal London Ophthalmic Hospital. R. A. D. CRAWFORD.

Rocking Apparatus for Artificial Respiration

SIR,—There is little doubt that the rocking method of artificial respiration is the most efficient from all points of view. It is not a skilled operation, and can be carried on for long periods without exhausting the manipulator. Treatment for shock can be instigated simultaneously. Air flow is larger than in the other methods, and injury to the thorax does not become an insuperable difficulty. However, there is still room for improvement. Take the case of the usual method with a stretcher balanced on some support such as a trestle. When rocking at the desired speed, there is little pause at either end of the arc of movement to enable the viscera to flop on to, or away from, the flaccid diaphragm; in fact, centrifugal force will tend to nullify this action. In other words, the organs on one side of the point of suspension will tend to be forced towards the head, and on the other to the feet, as in the first diagram. To have the point of suspension below the stretcher would be even more undesirable, as the body, in addition to being rocked, would have a to-and-fro movement causing a lag in the movement of the abdominal viscera due to inertia.

FIG. 1

The ideal arrangement would be somewhat similar to a swing-boat at a fair, with the point of suspension above the stretcher; then neither centrifugal force nor inertia would interfere with the desired result; the inertia of the abdominal organs would rather be of assistance, for apart from the pauses at the end of every swing, when the head is moving in the downward position, the diaphragm will be pressed against the abdominal organs, thus increasing their apparent weight, and when the feet are moving downwards the viscera will lag behind and will increase the negative pressure on the diaphragm which their weight in the downward position would normally produce. Or, again, in addition to the rocking movement, the organs would be "shuffled" backwards and forwards in the body, and the one act would augment the other.

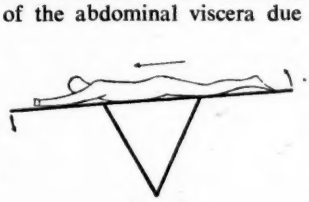

FIG. 2

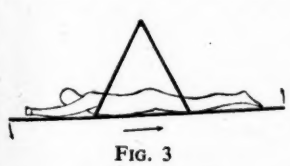

FIG. 3

In conclusion, a stretcher suspended by rope, etc., from a point above it, and attached at four points on the stretcher, and swinging through a considerable arc as in the above-mentioned swing-boat, or as a pendulum, would be more efficient from the respiratory point of view than the usual seesaw method.—I am, etc.,

E. GRANGER, M.B., Ch.B.

Vishnievsky's Ointment

SIR,—Thanks to the courtesy of the Soviet Embassy, and particularly the deep interest of Madame Maisky, the Anglo-Soviet Medical Council now disposes of a sizable and significant collection of recent Russian medical publications. In some of this contemporary work one frequently meets with references to a preparation called Prof. Vishnievsky's ointment. Prof. Akhutin in his extraordinarily useful book *Military Field Surgery*, 1941, speaks of it thus: "The majority of surgeons who have used this ointment at the front speak positively of Prof. Vishnievsky's ointment, which has been widely advocated in recent times." He gives the composition of the ointment as ol. cadini 5.0, xeroformii 3.0, ol. ricini 100.0. (I have not been able, unfortunately, to find out whether this ointment is dispensed ready for use or needs sterilization before application.)

It appears from other papers that Prof Vishnievsky's ointment is being extensively used on the [illegible]sian front and in Army hospitals. It is applied in a varie[illegible] of ways and over the widest range of injuries. Many surgeons adopt it as the dressing after primary excision of wounds, leaving this first dressing undisturbed for days and longer. It is used with success in cases of burns, electrical burns, frost-bite, compound fractures, abdominal wounds, etc. It is being inserted as impregnating material for packs and drains after laparotomies and in cases of pneumo- and haemo-thorax. It is claimed that this method promotes adequate drainage, stimulates phagocytosis, mobilizes nervous trophic influence in the later regeneration of the tissue, greatly diminishes pain, and eliminates the need for frequent change of dressing. Many workers use it as a wound dressing in cases of plaster casts, either closed or open by means of a "window" or "bridge."

It would be interesting to know if any of your readers have had experience of this ointment and, if so, with what results.—I am, etc.,

L. CROME,
Captain, R.A.M.C.

Care of the Elderly Infirm

SIR,—There is a tendency to think of the Beveridge plan only in terms of allowances, pensions, contributions, and benefits—in other words, to think that social security and happiness can be bought. There is, however, a large section of the community—viz., old people—to whom no amount of increase in monetary tokens will bring security of body or mind. Theirs is indeed a hard lot to live in loneliness or on sufferance with married sons or daughters. In the first case they often live a hermit's life and can only obtain the necessities of life and domestic help with the greatest difficulty; in the second, they are intruders in the young family, a position undignified to the elderly and unsatisfactory to the young. Surely something should be done to remove this blot on our social conscience—as at some time or another the problem affects every family—by providing suitable housing with domestic and medical facilities for our superannuated, where they may live independently, as they did before they ceased to be self-sufficient.

Pensioners with incomes from £2 18s. a week might live in small houses or bungalows, with visiting domestic helpers and a matron or kind woman to visit daily. This should be practicable even as the first step of a plan of social security, and the objection that it would be too costly cannot be made against it because for several years at any rate such a scheme would be self-supporting. Many of these old people, rich and poor alike, would give practically all their annual income, be it £1,000 or £50, to be assured of freedom from anxiety, loneliness, and fear of illness. Could not the B.M.A., as part of the scheme of reconstruction of hospitals, bring about this much-needed and overdue reform for the care of the elderly infirm?

A case in point occurring in my own experience this week might, taking the whole country, be multiplied several thousand times: Mrs. P., aged 71, living alone in a bungalow, rather isolated, was "not too well"; her neighbours were anxious about her. One undertook to come and see her if, on any morning, the kitchen "black-out" was not taken down at the usual time. One night Mrs. P. went to bed in great agony (a perforated appendix), too ill to put up the black-out. Next morning her friend saw the black-out was down and did not call. But for a kindly plumber who by chance called to repair a pipe the old lady might have delayed even longer than 36 hours before medical aid was received. A nurse or matron, as I have suggested above, might call twice a day on these elderly people and obviate this terrible suffering.

A comprehensive system of social security should include every member of the community, and it is the duty of everyone, especially the medical profession, to bring this about as a first consideration and not as an afterthought.

—I am, etc.,

Ruthin. TREVOR HUGHES.

War Pensions

SIR,—The recent debate in the House of Commons has raised misgivings in many people, probably shared by most medical men. The phrase "attributable to military service" is so difficult to define that many hard cases must inevitably arise and sometimes actual injustice may result. "Caused by service" is fairly straightforward, but "aggravated by service" is capable of many diverse interpretations. The tribunals to be set up as final appeals almost immediately will certainly help to remedy matters, but unless some type of "counsel for the plaintiff" is permitted, the soldier will have formidable opposition arrayed against him in the shape of experts, medical inspections, records, and precedents. We may take it that all the evidence will be available to both parties, but the soldier's case must be presented in such a manner that the members of the tribunal will be confident that nothing relevant has been omitted.

There is already noticeable a certain coyness in supplying information to doctors about patients who have been discharged from the Services and who will be reinstated on their lists. I have on request received most courteously from the Ministry of Pensions a summary of the medical notes and diagnosis in a patient now discharged from the A.T.S., but it is marked "For confidential information in connexion with the treatment of the patient." This is a borderline case as regards pension, but with that proviso I feel myself in some degree handicapped in giving advice to her about a pension appeal.

The impartiality of the tribunals will of course be beyond question, and they will function like High Courts, no doubt, but here no one disputes the necessity for skilled legal representation. In pension cases I should like to see a panel of practitioners appointed, the members of which would in suitable cases do the "devilling" for the soldier's representative.—I am, etc.,

Maybole, Ayrshire. R. M. WALKER.

Water for Rabbits and Guinea-pigs

SIR,—If Dr. E. L. Kennaway had been familiar with the literature of rabbit and guinea-pig management, a good selection of which was bequeathed by the late Henry Gray to the library of the Royal College of Veterinary Surgeons, I think he might have modified some of his statements (June 19, p. 760). His valuable observation that 2.5-kilo rabbits on a total dry diet will drink about 160 c.cm. of water daily confirms the advice of 19th-century fanciers that rabbits solely dry fed require about one-third of a pint of water or milk daily. For guinea-pigs so fed the old fanciers recommended about a tablespoonful of water or milk daily.

Before knowledge of such infections as coccidiosis was available to them 19th-century fanciers had rightly attributed outbreaks of disease to the fouling of drinking-water by the rabbit's excreta. The mistake was made by copyists and hack-writers of removing this advice from its context and serving it up as a reason for not supplying drinking-water. This "superstition," which Dr. Kennaway rightly exposes, cannot be attributed to the experienced breeders.

The results of Dr. Kennaway's tests of various water receptacles confirm the 19th-century fanciers, who were at pains to condemn shallow saucers, which the rabbit invariably tipped up. They recommended and illustrated a variety of flat-bottomed high-rimmed bowls and adaptations of the "fountains" used by pigeon and poultry fanciers. The modern water-bulb is merely a modification of the inverted bottle and tube-pierced stopper, which I was persuaded to adopt when I began breeding rabbits and guinea-pigs some 40 years ago.

If to-day there is need for dispelling ignorance of the management of small animals and birds in health and disease it was patent to the fanciers and some veterinary pioneers of the last century, who left a considerable corpus of knowledge which is worthy of our acknowledgment.—I am, etc.,

London, N.W.3. TOM HARE.

The Government's Proposals

SIR,—Let us review for a moment the policy of the Minister of Health. First he probed the medical "front" by widening the income limit to enable persons with an income of £420 a year to obtain insurance treatment and benefits. Having accomplished this without drawing any medical "fire," he sends over an enormous bomb, so big that he believes it will smother all opposition.

After reading the Minister's proposals one cannot help wondering if he regards us as belonging to the order of the simple-minded. We may be "the silent profession," but that does not imply that we are mentally defective. Being convinced that these proposals would be disastrous to our calling and subversive of our professional freedom, we should make an end of this state of things once for all. Let the B.M.A. forthwith institute a covenant to be signed by all qualified men and women pledging us to stand by one another, determined that our rights as free men shall be maintained, and that the pathetic stampede of 1912 shall not again take place. We chose the profession of medicine as our lifework, and it behoves us to hand it on undefiled to our successors. We have the power, and if we stand together, conscious that we have done our duty, none can move us unless we choose.—I am, etc.,

Frodsham, Cheshire. HENRY H. JAMES.

Universities and Colleges

UNIVERSITY OF OXFORD

In a Congregation held on June 12 the following medical degrees were conferred *in absentia:*

B.M., B.CH.—T. P. Morley, N. B. Myant, A. E. Mourant, R. H. Cowdell, J. N. Macbeth.

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examination indicated:

FINAL M.B.—*Part 1 (Surgery, Midwifery, and Gynaecology):* D. Ainslie, J. Attenborough, A. S. Barling, W. Beautyman, S. B. Bennett, J. H. E. Bergin, V. L. Billington, L. L. Bromley, J. C. Burne, K. Chitty, M. H. Clement, W. R. Cole, R. A. D. Crawford, F. A. L. da Cunha, P. J. Vescovi, G. H. P. Drake, H. L. English, A. M. H. Fisher, M. R. Geake, K. O. George, R. V. Gibson, A. J. Gray, J. A. Hallinan, G. Hildick-Smith, R. F. Hobson, G. M. Homan, M. C. Hudson Bennett, W. N. Ingham, J. A. Loveless, J. B. Lyon, H. A. B. Nicholls, T. Norman, R. G. F. Parker, A. N. Pearson, R. A. Peebles Brown, W. R. Probert, B. O. Reed, B. W. Rhodes, M. H. Russell, E. S. O. Smith, P. S. Smith, D. H. K. Soltau, P. G. Somerville, I. S. Staddon, P. R. Swyer P. Venables, D. Verel, M. M. Walker, J. Wedgwood, D. B. B. Whitehouse, H. B. Whitmore, A. J. W. Woodroffe. *Women:* M. L. Cox, I. S. King, R. S. Mitchison, M. Sidgwick.

UNIVERSITY OF LONDON

The report of the Acting Principal, Mr. Harold Claughton, on the work of the University during the year 1942–3 mentions that several schools have decided that, provided certain essential repairs to their London buildings can be undertaken, they should return to London. Among these are King's College, which hopes to bring its remaining Faculties back from Bristol, following the return, which has already taken place, of the medical students from Birmingham; the London School of Medicine for Women, which is bringing its pre-clinical students back from Exeter; the London Hospital Medical College, whose pre-clinical students are returning from Cambridge; the Middlesex Hospital Medical School, whose pre-clinical students have returned from Leeds; and the whole Medical School of University College Hospital, because the sector hospital in which teaching has so far been conducted is now put to other uses. Certain schools have suffered such heavy war damage that it is most unlikely that they will be able to return until after the war; among these is St. Bartholomew's Hospital Medical College. The section of the report on teaching and research says that in the case of medicine, to meet the urgent demand for doctors for the Forces, the time required to be spent on the full medical course (but not the course itself) has been shortened and additional examinations have been held. At the London Hospital Medical College Prof. A. W. M. Ellis has resigned from the Chair of Medicine on his appointment as Regius Professor of Medicine at Oxford. At the Middlesex Hospital Medical School Dr. B. W. Windeyer has been appointed as the first occupant of the Chair of Radiology, which, though instituted in 1920, had never been filled. At University College Hospital Medical School Prof. C. R. Harington has resigned the Chair of Chemical Pathology and his post as Director of the Graham Research Laboratories on being appointed director of the National Institute of Medical Research. At the Royal Cancer Hospital Dr. G. A. R. Kon has been appointed to the Chair of Chemistry.

UNIVERSITY OF BRISTOL

A week-end course in industrial medicine will be held at the University of Bristol on Saturday and Sunday, July 10 and 11. The course has been arranged in co-operation with the Association of Industrial Medical Officers. The syllabus includes a visit to a factory and lectures as follows: "Heating and Ventilation," by T. Bedford, D.Sc., "Protective Clothing and Appliances," by R. Tugman, "Health Surveys in Factories," by Donald Stewart, M.D., "Foot Faults in Relation to Form and Function," by W. Sayle Creer, F.R.C.S. Fee for the course £1 1s., payable to the University of Bristol and sent to the Dean of the Faculty of Medicine, University of Bristol, not later than July 7; full syllabus may be obtained from him.

UNIVERSITY OF SHEFFIELD

The University Council at its last meeting appointed Mr. W. J. Lytle, F.R.C.S., as Lecturer in Surgery.

Obituary

The sudden tragic death of Dr. CORNELIUS COTTER at his home at Lee Green on May 14 robbed the Tower Hamlets Division of its kindly and genial chairman and Poplar one of its best-loved practitioners. Dr. Cotter was born at Blarney, County Cork, in 1896. He was educated at Cork and graduated M.B., B.Ch., N.U.I. in 1918. Immediately after graduating he joined the Royal Navy and served with the Atlantic Fleet. While he was a surgeon-lieutenant he played rugby for the Devonport Services. He remained in the Navy until 1924, when he married and settled down in Poplar, to undertake the arduous duties of a busy East End practice. With his kindly sympathy, his ready wit, and his never-failing sense of humour, he quickly won his way to the hearts of his patients and his fellow practitioners alike. Although most of his time was ungrudgingly spent in the service of his patients, he devoted a great deal of his leisure to the interests of the local division of the British Medical Association. He was chairman of the Tower Hamlets Division for the past eight years. It was here that his colleagues learned to appreciate his wide guidance, his jovial Irish humour, and his clear grasp of the essentials of the subject of debate. The troubled years of the war added greatly to his burdens and responsibilities. To the office of chairman of the Local Medical War Committee he brought all his gifts of judgment and kindness and sympathy which made it a pleasure to sit with him. Even when he was ill he did not spare himself in the service of his patients, his colleagues, and the Tower Hamlets Division.

J. A. McL.

The death occurred on May 18 at St. Leonards-on-Sea, after a long illness, of Dr. GERALD A. TICEHURST. He was 64 years of age, and was born in the same town. Educated at Tonbridge School and St. John's College, Cambridge, he qualified at Guy's Hospital M.R.C.S., L.R.C.P. in 1904, and obtained his M.B., B.Ch.Camb. in 1906. He was a scholar of his College at Cambridge and obtained 1st class honours in the Natural Sciences Tripos. He held the appointments of house-physician and obstetric resident at Guy's Hospital, and clinical assistant at the Hospital for Sick Children, Great Ormond Street. In 1907 he succeeded his father and grandfather in general practice in St. Leonards-on-Sea, and for over 30 years was honorary physician to the Royal East Sussex Hospital, and latterly honorary gynaecologist. During the last war he served as a captain in the R.A.M.C. in France and Gibraltar. He will be remembered in the town and district for his devoted service to many families, rich and poor alike, and also by his nearest friends for his interest in fishing, shooting, and music. He leaves a widow and two sons.

Dr. JOHN MOORCROFT MCCLOY, Chief Medical Officer, Ministry of Home Affairs, Northern Ireland, and Honorary Physician to the King since 1941, died at his home in Belfast on May 27. Born in Philadelphia in 1874, the elder son of James McCloy of Belfast, he was educated at Queen's College, Belfast, and graduated M.B., B.Ch., B.A.O. with honours at the Royal University of Ireland in 1909. After the creation of Queen's University, Belfast, he received the degree of M.D. with commendation in 1912, and also the D.P.H. Dr. McCloy was for many years medical inspector under the Local Government Board of Ireland, and during the last war served in the R.A.M.C. with the temporary rank of captain. In addition to his high post in the Ministry of Home Affairs he was also chairman of the Joint Nursing and Midwives Council for Northern Ireland, President of the Ulster Medical Society in 1938-9, and had been a member of several Government Commissions. Dr. McCloy joined the British Medical Association in 1911. He published papers on bacteriological subjects during his period of service in the R.A.M.C. and after the armistice.

Prof. WILLIAM BOXWELL, senior physician to the Meath Hospital and the County of Dublin Infirmary, died on May 22, aged 67. A grandson of the famous Dublin physician, William Stokes, William Boxwell studied medicine at Trinity College and graduated M.B., B.Ch., B.A.O. in 1903. He was elected F.R.C.P.I. in 1908, and proceeded to the M.D. in 1912. In 1918 he was appointed to the chair of pathology in the School of the Royal College of Surgeons in Ireland after serving as assistant pathologist at the Meath Hospital, where he continued to work for many years as physician. In 1937 he succeeded Dr. J. A. Matson as President of the Royal College of Physicians of Ireland. Prof. Boxwell was a member of the British Medical Association and had served on the Council of the Royal Academy of Medicine in Ireland. As an accomplished clinician, having daily associations with the laboratory and the post-mortem room, he held an unusual place in the medical world of Dublin, performing with grace and efficiency his two-fold duties at the Meath Hospital and at the Royal College of Surgeons.

Dr. DAVID MEIKLE, who died at the age of 45 on May 25, had practised in the Warrington area for 20 years. A native of Glasgow, he served in the Navy during the last war. He graduated M.B., Ch.B. at the University of Glasgow in 1921 and then held house appointments at the Western Infirmary and the Glasgow Royal Asylum. Before settling in Warrington he had practised for a short time in Ayrshire. A colleague writes: Dr. Meikle will be sadly missed in Warrington. Keenly interested in medico-political matters, he was a live wire at all our Association meetings, and for a time was an enthusiastic and efficient secretary of the local Division. Dr. Meikle had an exceptional capacity for making lasting friendships, and he enjoyed nothing more than playing host to his numerous friends. A victim of ill-health, he never spared himself, and to his unselfishness may be attributed his untimely end.

The death is announced on May 25 at Newcastle-upon-Tyne of ALEXANDER ANGUS MARTIN, at the age of 80. He was educated at Surgeons' Hall and Edinburgh University, where his teachers were Argyll Robertson, J. W. Ballantyne, Francis Caird, and Charles Cathcart. With the three last-named he formed life-long friendships. After qualifying in 1887 he could not afford to spend time as a house-surgeon but went instead as a surgeon on a whaler to the Arctic. He became assistant in Hartlepool to the late Prof. Rutherford Morison, who later helped him to start practice in Percy Main, whence he went to North Shields. He very soon established a large general and surgical practice. He had unusual self-reliance and was doing abdominal surgery successfully as far back as 1893. Dr. Angus Martin was one of the original surgical staff of the Tynemouth Jubilee Infirmary. He took the F.R.C.S.Ed. in 1898 direct from general practice after only a very few weeks' coaching in Edinburgh—no mean achievement in those days. He regularly attended at the meetings of the old Northumberland and Durham Medical Society, and became its president in 1912; his presidential address was a description of the progress of surgery in the previous quarter of a century, and his year of office was marked by addresses by his old friend C. W. Cathcart and Sir Robert Jones. He retired from practice in 1925. For the past 17 years he had been consulting surgeon to a group of collieries. His first wife died in 1930 and he married again in 1932. There were seven children of the first marriage. His eldest son, Dr. N. A. Martin, served abroad in the last war and is in practice in Bristol. Three sons are now serving over-seas.

The death of Dr. FREDERICK GARDINER ROSE, O.B.E., which occurred at Georgetown, British Guiana, on Jan. 22 last, has deprived the medical profession in this Colony and the West Indian Islands of one of its leading members, and leprologists of one of the most indefatigable workers in their specialty. Rose was born in British Guiana in 1865 and, having won the much-coveted Guiana scholarship, he entered St. John's College, Cambridge, in 1907. After taking his B.A. he went on to St. Thomas's Hospital, London, and obtained the Conjoint Diploma in 1911, the Cambridge M.D. in 1926, and later the D.M.R.E. and M.R.C.P. After several appointments in England he returned home, having been appointed by the Colonial Office as Government bacteriologist and pathologist in 1915. In 1926 he assumed charge of the Leprosy Hospital at Mahaica, where he spent the best part of his career in the reorganization of the administrative side and treatment of leprosy by modern methods. He took up the treatment with hydnocarpus oil and

its esters by local injections, and, having achieved good results after several years' trial in early cases, he overcame the natural reluctance of persons suffering from leprosy to seek treatment, thus securing early confidence in the community and obtaining admission to the Leprosy Hospital of early sufferers. During his regime as Government bacteriologist Dr. Rose devoted special research to the filarial diseases which were so prevalent at the time in Georgetown; he devised a vaccine which is still being used in the treatment of filarial lymphangitis and obtained successful results in arresting the symptoms in early cases. He also took special interest in the establishment of the local tuberculosis society in 1911 and was for two periods president of the British Guiana Branch of the B.M.A. In 1938 he was chosen to represent the Colony as its delegate at the International Leprosy Conference in Cairo. In 1942 his health began to fail and he went to the U.S., where he was operated on at the Mayo Clinic; after a few months his condition deteriorated, and while on a sick bed he received the award of the O.B.E. as a belated recognition of his brilliant public services.

The late Dr. FREDERICK JAMES JAYNE of Talgarth, Breconshire, studied medicine at the University of Glasgow and graduated M.B., C.M. in 1895 at the age of 21. He began practice at Talgarth as an assistant nearly 48 years ago. He was made a J.P. for the county in 1907, and for some years had been chairman of the local Bench; he also served on the Hay Rural District Council. From 1914 he acted as M.O.H. to the council until the appointment of a full-time medical officer for a combined district. Dr. Jayne was a member, and for some years chairman, of the County Insurance Committee and served long on the Health Committee. He also took a leading part in many other local activities, including the Breconshire War Memorial Hospital, the Pontywal Sanatorium, of whose house committee he was chairman, and the District Nursing Association. His two sons followed him in the medical profession, Dr. Robert Jayne succeeding to the practice, and Dr. John Jayne now serving with the R.A.M.C. in North Africa.

C. J. S. G. writes: Having been a close personal friend, since student days, of W. J. EASTWOOD, or "Jimmie," as he was popularly known, I would like to say how great a loss his passing will mean to his very many friends and patients everywhere, but particularly so in the Liverpool, Wigan, and Chorley districts. His humanity, kindness, sense of humane unfailing sympathy without sentimentality endeared him to all, and he was greatly loved by children. It was a fitting tribute to a fine character to see so many of his former patients paying their respects at the memorial service held in Wigan.

The Services

Capt. (temp. Major) W. A. Heggie and Capts. P. S. Barclay, F. H. Edwards, N. Gill, L. G. Harper, and K. F. Patton, R.A.M.C., have been awarded the M.C. in recognition of gallant and distinguished services in the Middle East.

Dr. N. H. R. McCallum, Merchant Navy surgeon, has been mentioned in dispatches for great skill and devotion to duty under most difficult conditions.

AUXILIARY R.A.M.C. FUNDS

The Auxiliary R.A.M.C. Funds are to extend help to cases arising out of the disablement or death of doctors or dentists in the present war. By this extension, which was inaugurated at a recent meeting presided over by Lieut.-Gen. Sir Alexander Hood, D.G.A.M.S., financial help will be given to officers of the auxiliary branches (Special Reserve, Territorial Army, and the new Army) of the R.A.M.C. and the Army Dental Corps who are incapacitated wholly or in part as a result of wounds, sickness, or accident due to service in the present war; and to the widows and children of such officers killed in action or dying of wounds, etc. The Auxiliary R.A.M.C. Funds were founded by the late Lieut.-Gen. Sir Alfred Keogh in 1916 when he was D.G.A.M.S., and approximately £80,000 has been distributed for the benefit of widows and children of officers and men killed in action or severely disabled during the last war. The minimum annual subscription has been fixed at one guinea, and it is hoped that all intending subscribers will make their subscription retrospective. Cheques, etc., should be made payable to the Auxiliary R.A.M.C. Funds (1939), and sent to the honorary treasurer at 11, Chandos Street, London, W.1.

CASUALTIES IN THE MEDICAL SERVICES

Wounded.—Lieut. F. K. Crittenden, R.A.M.C., War Subs. Capt. G. D. McIntosh, M.C., R.A.M.C., War Subs. Capt. J. M. McKiddie, R.A.M.C., War Subs. Capt. G. D. Park, R.A.M.C., Capt. W. F. White, R.A.M.C.

Missing.—Lieut.-Col. A. C. Craighead, I.M.S.

Prisoners of War.—Major D. McC. Black, I.M.S., Capt. A. M. McGavin, I.M.S.

Medical Notes in Parliament

DECREASE IN POPULATION

Attention was directed to the threatened decrease in the population of this country in the House of Lords on June 8 when Earl DE LA WARR asked what consideration the Government were giving to the matter. Lord GEDDES contended that the serious fall in the birth rate really began as far back as 1780-90. There was not a very large fall till 1830, but from then onwards the trend had made itself manifest. There was an enormous increase in population with the change in economic conditions following the industrial revolution. In point of fact, however, the fertility rate was lower, and the increased population was the result of a vastly increased survival rate. That increase in survival rate was going on, but it was not the same thing as having an adequate supply of young life.

Beyond all this question of the fall in the birth rate there was a biological problem of the most serious kind. The whole question of what was happening to the germ plasm was such that it was possible to understand it in the human being very slowly, and they had to turn to animals to see what was going on. In Marshall's book they would find that wild animals brought into captivity, whose conditions of life were changed, at once showed perhaps a complete cessation of, or anyhow a drop in, reproduction. Changes of diet changed reproduction.

Coincidence of Higher Standard of Living

The fall in the human birth rate between 1780 and 1790 came along slowly during the Napoleonic wars. The fall was still slow during the economic chaos after those wars. In the 1830's the birth rate went down at the very time when the standard of living was going up and when the conditions of life were changed by the tighter packing of people in the cities. That suggested that there might be something comparable between that and the experience with regard to animals. It might be due to the whole change that was taking place in the conditions of life that the germ plasm in some places seemed to lose its capacity or almost its desire to reproduce. It was strange that with all this new luxury and new increased nutrition there should be a sudden drop of that sort in reproductive power.

He believed that much of the unwillingness to have children had really got its origin in the germ plasm, which itself was not actively reproductive, and that that was affecting the psychology of human beings. There should be a Royal Commission or, much better, a real general Staff of Health to go into the question of reproduction and other matters. Was there any hope, at the present stage of scientific knowledge, of finding a way to reverse the trend—if it, in fact, was a trend—of the plasm? He begged the Government to realize that there were reasons for believing that there were biological grounds at the back of this.

Medical Views

Lord DAWSON said that the facts were abundantly clear and their significance was ominous. From 1880 there had been a steady fall in the birth rate so that now 100 women, in the active generative period of their lives, who at one time would have produced 150 girl babies, would now produce only 75 or 76. It was clear that the nation was not reproducing itself. The composition of the population had been going wrong, and there had been an increase in the proportion of persons over 60 and a decrease in the proportion under 20. This meant that we should inevitably have a nation which was no longer replenishing itself. The pensioners were beginning almost to over-reach the producers. The facts of the change in the composition of the population and the decline in the birth rate were accepted by everyone. He agreed with Lord Geddes that there was a matter for inquiry, not by a Royal Commission but, he suggested, by a widely representative body of inquiry like the Royal Society.

While he believed that the very strong love of children had in no whit diminished, side by side there had developed a much more sensitive conscience about the individual life. While in the last century there was a very high birth rate, if all the children had lived life would have been economically impossible. The pregnancies far exceeded the number of surviving children, and the real safety-valve was the high infant death rate. The social conscience of to-day was far more developed than in the days of our mothers and grandmothers. It arose, first, from the dislike of losing children, and, secondly, from a dislike of the large infant birth rate. It was that gradual pressure of events which brought contraception to the front of the stage. In this century people said that they did not want quantity of children but quality.

Contraception and Unemployment

Turning to the question why parents kept their families small, Lord Dawson said he had no belief whatever in an insufficient fertility. In case after case one found that if contraception was taken off, pregnancy began, though not always as quickly as one would wish. He did not dispute with Lord Geddes that there might be in the background a change in the germ plasm. The reason why parents kept their families small was, first, reaction to the knowledge that contraception had given them. Another cause of smaller families was fear of unemployment, fear of want, and fear for the careers of the children. Family allowances were and would be a great help as a contribution for every child that was born. That alone, however, would not be sufficient. Children should be a choice, not a chance. Young married people should be told that the determination whether they had a child or not was their responsibility. Propaganda was wanted, pointing out that the population was going down, that it depended on parents whether England remained a great Power, and that the possession of children would bring them health and the enduring happiness of family life.

A " Staggering Contrast "

The Duke of DEVONSHIRE said he viewed the birth rate figures with the utmost alarm. It was beyond question that the birth rate per 1,000 had fallen steeply and rapidly from the quinquennium 1876-80, when it stood at 35.3 per 1,000, until quite recently, when in the quinquennium ending 1935 it was 15.3 per 1,000. That was a staggering contrast. If we wanted a larger birth rate we must take measures to secure larger families. There was a difference of opinion on these matters. He was by no means sure that contraception was the fundamental cause of the fall. An important contributory fact was the desire to give one's children at least as good a start in life, if not better, than one had had oneself. The real facts might be obscured through a dependence on statistical examination and demonstration for their establishment. The Minister of Health believed it would help to a clearer understanding if the more technical statistical elements were isolated and dealt with in the form of an impartial statement, covering the whole of the necessary statistical background. To meet a real need in that regard the Minister proposed to publish a document in which the statistical aspect would be set out and discussed in a reasoned and balanced manner. This document would necessarily be confined to the factual aspect of the question, but it would take into account such evidence as had become available since the preparation of the recent White Paper, and would embrace a longer period than was dealt with in that document, which did not go beyond 1871. The Government were keeping their eyes on the whole question, and he would see that the demand for a real authoritative inquiry was passed on to the Minister of Health.

Departmental Medical Services

On June 8 Sir PERCY HURD asked the Secretary to the Treasury what Departments had medical services of their own, and what was the total personnel and cost. Mr. ASSHETON said that in the Post Office a headquarters medical branch of about 25 was maintained at an estimated annual cost of about £12,275, and, in addition, capitation fees amounting to about £65,000 a year were paid to some 2,600 local medical officers. Very much smaller services of the same kind were provided in the Inland Revenue, Customs and Excise, and Ordnance Survey Departments, occupying in the aggregate less than half a dozen officers and costing under £2,000 a year. Medical service was at present provided in ordnance factories under the Ministry of Supply, but detailed information was not yet assembled. The question of bringing these departmental services into the new national health organization would be one of the matters to be considered in connexion with any new national health service.

Diphtheria Immunization

In the House of Lords on June 8 Lord MARLEY asked the Government to furnish the latest information available on the effects of antidiphtheria immunization, specifying the number of cases and the number of deaths of children who had been immunized and of those who had not been immunized, and the total number of children in each category. Lord SNELL said that the latest figures available, which did not include children privately immunized outside the arrangements made by local authorities, and did not therefore cover the entire child population, were as follows: The number of children under 15 immunized under local authority auspices in England and Wales during the three years 1940, 1941, and 1942 was approximately 3,748,000, and it was reasonable to assume that up to the present about one-half of the present child population had been immunized. Among nearly 96,000 children shown in local authority returns as having contracted diphtheria in the same three years, about 7,370 had completed the course of immunization, compared with over 88,000 not so protected. Returns of deaths from diphtheria, distinguishing immunized from non-immunized, had been obtained from local authorities since January, 1942, only. During 1942, of 1,522 children who died from diphtheria, 41 were immunized and 1,481 were not.

Mr. ERNEST BROWN in the House of Commons has informed Mr. Alfred Edwards that his memorandum on Northamptonshire diphtheria and immunization related to the period Jan., 1941, to Dec., 1942, and the immunization figures of 46% under 5 and 74% between 5 and 15 years applied to the estimated position on Dec. 31, 1942. Mr. Brown also stated that the returns which a local authority was asked to make to his Department, and the records which the medical officer of health therefore needed to keep for this purpose, related to children immunized in the authority's own area under its own arrangements for free immunization. The information asked for in the returns was the number of children thus immunized in the period to which the return related and who were at the time of immunization under 15.

Status of V.A.D. in Military Hospitals

Sir JAMES GRIGG on June 8 informed Miss Rathbone that he proposed, so far as the War Office was concerned, to accept the report of the Committee on the status of the V.A.D. in military hospitals, but as he undertook to make a statement to the House before taking action, he would not actually promulgate the decision until he learned whether it was the wish of the House to discuss the report. He understood that the voluntary bodies concerned were satisfied that the recommendations made by the committee offered a fair solution to the problem, having regard to the many factors which had to be considered. Miss RATHBONE asked if Sir James Grigg as well as the voluntary organizations concerned were on the whole satisfied with the recommendations. Sir JAMES GRIGG: I think on the whole it is a very satisfactory solution of the problem.

Medical Examination of Home Guard.—On June 1 Mr. E. P. SMITH asked the Secretary of State for War whether, in view of the fact that many members of the Home Guard were elderly and were expected to undergo considerable strain during training and exercises, he would consider instituting some form of medical examination to ascertain their physical fitness for their tasks. Sir JAMES GRIGG said that a Home Guard might be discharged if he himself or his commander considered that he was unfit on grounds of health to carry out his duties, and if this was confirmed by a medical examination. A man directed into the Home Guard by the Ministry of Labour might appeal against the direction on medical grounds. He, too, was medically examined before a decision was taken. In view of these arrangements it was, he thought, unnecessary for all Home Guards to undergo a medical examination.

Repatriation of Doctors.—Sir JAMES GRIGG said on May 11 that exchange of British and Italian sick and wounded was being carried out strictly in accordance with the Geneva Convention relative to the treatment of prisoners of war. That Convention laid down that doctors, medical orderlies, and others exclusively concerned with the care of sick and wounded should be sent back to the belligerent to which they belonged. It had been agreed with the Italian Government that a sufficient number of these personnel should be retained to look after the needs of other prisoners.

Anti-vaccination Publicity.—On May 12 Mr. MANDER asked the Minister of Supply what were the conditions under which paper was supplied to the British Union for Abolition of Vivisection for the purpose of attacking, on large placards throughout the country, the Government's diphtheria immunization campaign. Sir ANDREW DUNCAN said he had been unable to trace that any paper had been licensed specifically for these placards. He was making further inquiries into the matter.

Certification Fees.—Mr. HUTCHINSON asked on June 3 whether in cases where a patient required his panel doctor to complete the necessary forms for certificates for additional milk and eggs, the doctor was authorized to charge a fee. Mr. BROWN replied that doctors were required to give medical certificates only for the purposes of the National Health Insurance Acts. They were not forbidden to give and charge for certificates required for other purposes.

Pneumoconiosis Regulations.—On June 8 Sir WILLIAM JENKINS asked the Secretary of State for the Home Department if he would state the cause of the delay in issuing the Regulations dealing with pneumoconiosis, and what was the increase in the number of men suffering since 1941 to the latest available date. Mr. PEAKE said he understood that the hon. member was referring to the compensation scheme and benefit scheme for this disease among coalminers. The delay was due to the necessity for consulting the employers' and workers' associations. Representations had been received on a number of points which were under consideration, and the Home Secretary hoped to settle the schemes very shortly. No figures as to the number of men suffering from pneumoconiosis were available.

Deep X-ray Tubes.—On June 8 Miss HORSBRUGH said that the Minister of Health was aware of the present shortage of deep *x*-ray tubes, which had to be imported from America. The Ministry, in conjunction with the Ministry of Supply, was taking all possible steps to secure an increased number of these tubes. As soon as a consignment was received they were allocated, on the advice of the Ministry of Health, to hospitals most in need of them.

No. 23

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended June 12.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1943 (a)	(b)	(c)	(d)	(e)	1942 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	50	2	30	5	8	140	8	28	1	5
Deaths		1	3				1	1		
Diphtheria	607	45	178	51	27	637	27	145	56	21
Deaths	7	3		1	—	12	—	1	2	—
Dysentery	127	10	135	—	1	55	3	54	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	3	—	—	—	—	—	—	—		—
Deaths		1					1			
Erysipelas			47	5	2			32	4	1
Deaths		—								
Infective enteritis or diarrhoea under 2 years				23					50	
Deaths	51	9	9	17	3	30	4	14	8	3
Measles	6,724	349	481	30	25	6,655	699	830	65	342
Deaths	3	1	2	—	1	6	2	4	1	3
Ophthalmia neonatorum	97	2	14	1	—	98	2	17		1
Deaths										
Paratyphoid fever	6	1	2			7	1	—		
Deaths	—	—				—	—	—		—
Pneumonia, influenzal*	637	31	4	4	3	687	27	19	3	2
Deaths (from influenza)	16	—	4	—	1	5	—	1	—	—
Pneumonia, primary			217	11				209	21	
Deaths		20		9	13		12		8	5
Polio-encephalitis, acute	2	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	5	1	1	3	—	6	—	—	—	2
Deaths		—			—		—			
Puerperal fever		1	15	—		—	4	12	2	2
Deaths		—			—		—			
Puerperal pyrexia†	143	10	29	—	—	151	11	18		3
Deaths		—								
Relapsing fever	—	—			—	—	—			—
Deaths					—					
Scarlet fever	1,966	195	231	37	53	1,025	65	200	62	39
Deaths	1	1	—	—	—	4	—	—	—	—
Small-pox	—	—	—		—	—	—	2		—
Deaths	—	—		—	—	—	—		—	—
Typhoid fever	5	—	4	6	—			3	5	2
Deaths	—	—		—	—			—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	2,063	122	240	46	38	1,350	144	48	42	12
Deaths	14	1	4	1	3	5	1	1	4	1
Deaths (0–1 year)	342	34	50	38	41	287	38	58	39	23
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,130	571	576	185	145	3,797	567	529	224	102
Annual death rate (per 1,000 persons living)			13·0	12·2	‡			11·9	15·0	‡
Live births	6,857	783	966	406	365	5,463	569	871	557	261
Annual rate per 1,000 persons living			19·7	26·7	‡			18·0	37·2	‡
Stillbirths	219	21	34			227	28	41		
Rate per 1,000 total births (including stillborn)			34					45		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire. (N.B., *not* Northern Ireland.)

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* the incidence of infectious diseases generally fell during the week—944 fewer cases of measles, 131 of acute pneumonia, 81 of whooping-cough, 29 of cerebrospinal fever, and 23 of diphtheria.

Diphtheria and scarlet fever fluctuated only slightly within the counties. Whooping-cough dropped in incidence in Yorks West Riding and London by 39 and 29 cases respectively, and rose in Lancashire by 38: these were the only noteworthy variations. The incidence of acute pneumonia fell in the North, a slight rise being general in the South-East and South-West.

Measles was down in Lancashire by 134 cases, Monmouthshire by 114, Oxfordshire by 105, Glamorganshire by 96, and in Essex by 91. Rises were recorded in a few counties, the largest being in Dorsetshire, 84, and in Norfolk, 74.

There were 2 more cases of dysentery than in the preceding week. The largest county totals were Lancashire 23, Liverpool C.B. 13; Gloucestershire 16, Bristol C.B. 4 (in the previous week 12 cases were reported from this city), Mangotsfield U.D. 6, Sodbury R.D. 4, Shombury R.D. 2; Warwickshire 12, Warwick R.D. 6, Birmingham C.B. 6 (23 cases were recorded in the previous week).

In *Scotland* there was a slight upward trend in the incidence of diphtheria, whooping-cough, and scarlet fever, with 18, 14, and 11 more notifications respectively; there were 36 fewer notifications of measles. Notifications of dysentery reached 135—or 100 more than in the preceding week. The chief centres of infection were Glasgow, Edinburgh, and Kincardine County, which had 33, 27, and 25 cases respectively.

The Week Ending June 19

Notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,686, whooping-cough 1,918, diphtheria 540, measles 6,472, acute pneumonia 587, cerebrospinal fever 59, encephalitis lethargica 2, dysentery 164, paratyphoid 12, and typhoid 7.

Medical News

A meeting of the Tuberculosis Association will be held at Oxford on July 8, 9, and 10. The following syllabus has been arranged: At Regent's Park College, Pusey Street, Thursday, July 8, 2.15 p.m., address by Prof. J. A. Ryle on tuberculosis as a social disease; 3.30 p.m., paper by Dr. A. H. T. Robb-Smith on diseases of the reticulo-endothelial system and their thoracic manifestations; at 5 p.m. the president, Mr. J. E. H. Roberts, will open a discussion on extrapleural pneumothorax. Friday, July 9, 10 a.m., Lieut.-Col. Theodore L. Badger, U.S. Army, and Mr. F. C. Ormerod will open a discussion on tracheo-bronchial tuberculosis; 11.30 a.m., Dr. F. A. H. Simmonds on pneumoperitoneum in the treatment of pulmonary tuberculosis. At the Radcliffe Infirmary, 2.15 p.m., radiological demonstration by Dr. F. H. Kemp; 3.30 p.m., paper by Dr. A. M. Cooke on systemic diseases complicated by tuberculosis; at 5 p.m., Lieut.-Col. Yale Kneeland, U.S. Army, will open a discussion on differential diagnosis between pulmonary tuberculosis and the atypical pneumonias, with particular reference to "virus" pneumonia. At Regent's Park College, Saturday, July 10, 10 a.m., Drs. C. H. C. Toussaint and E. K. Pritchard on experiment in tuberculosis case-finding.

A special film entitled "The Work of a Psychiatric Unit" will be shown by arrangement with the Ministry of Information at the Whitchurch Emergency Hospital, Cardiff, on Tuesday, July 6, at 2.30 p.m. and again at 6 p.m. Doctors will be admitted on presentation of their cards at the hospital.

The meetings of the Clinical Society of the Royal Eye Hospital have been resumed. On Friday, July 16, at 4.30 p.m. Dr. R. D. Lawrence of King's College Hospital will give a lecture on "Diabetes and Eye Diseases," and anyone interested will be welcome.

At an ordinary meeting of the Medico-Legal Society to be held at 26, Portland Place, W.1, on Thursday, July 8, immediately following the annual general meeting (which has been fixed for 5.30 p.m.) the president (Mr. Roland Burrows, K.C.) will read a paper on "Some Medico-legal Cases under the Ancien Regime." Members may introduce guests to the meeting; tea at 5 o'clock.

The annual general meeting of the Medical Society for the Study of Venereal Diseases will be held at 11, Chandos Street, W.1, on July 24 at 2 p.m. Subjects for discussion: "Hyperthermia in the Treatment of Resistant Gonococcal and Non-specific Urethritis" and "Physiological Changes in Fever Treatment."

Dr. Norman Tattersall, chief clinical tuberculosis officer for Leeds and lecturer in tuberculosis in the University of Leeds, has been appointed principal medical officer to the King Edward Welsh National Memorial Association, in succession to the late Dr. Dan Powell.

Dr. H. C. Maurice Williams, O.B.E., Port Medical Officer of Health, Southampton, has succeeded Dr. J. Greenwood Wilson, Medical Officer of Health, Cardiff, as honorary secretary of the Association of Port Health Authorities of the British Isles.

The Medical Pilgrims entertained representatives of the medical services of the United Nations at dinner on June 12 The following were the guests. Major-Gen. Sir Henry Tidy, President of the Association of British Physicians, Dr. Gordon Holmes, Lieut.-Col. Colin Ross (Australia), Col. L. C. Montgomery (Canada), Major H. D. Robertson (New Zealand), Gen. P. R. Hawley and Col. W. S. Middleton (U.S.A.), Prof. S. A. Sarkisov (U.S.S.R.), Major Gallemaerts (Belgium), Dr. P W. Lamb (China), Col. F. Langer (Czechoslovakia), Méd. Commandant Ségal (France), Dr. A. P. Cawadias (Greece), Lieut.-Col. C. F. Koch (Holland), Prof. Kojen (Yugoslavia), Prof. Johan Holst (Norway), and Col. H. Szczodrowski (Poland).

At the annual general meeting on June 18 of the Governors of Epsom College Lord Leverhulme, the president, said he was confident that independent schools like Epsom College would play a distinctive part in post-war education. In moving the adoption of the report, he congratulated the council on having reduced the deficit on the working account from £4,800 to £1,500, a result which would have been impossible without the most willing co-operation of the boys themselves in effecting wartime economies. Sir Cosmo Parkinson, when thanking the many helpers of the College for their efforts during these difficult times, emphasized the valuable assistance given by the Council of the B.M.A. In addition to contributing generous donations, the B.M.A. had handed over to the Royal Medical Foundation one-half of a legacy of some £7,000 from the late Dr. T. Connell Craig, on condition that a special fund, to be known as the " Connell Craig " Fund, should be established, its income to be used for the alleviation of distress at the discretion of the College council.

Dr. G. I. H. Braine, Malayan Medical Service, has been interned in Changi Camp, Singapore.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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ANY QUESTIONS?

Laborde's Method of Artificial Respiration

Q.—*In performing artificial respiration by Laborde's method in conjunction with another method, should the forward traction on the tongue coincide with the inspiratory phase or the expiratory phase?*

A.—The usual instructions for Laborde's method of artificial respiration are to draw the tongue forward during inspiration and allow it to retract during expiration. It is difficult to see what direct mechanical effect these movements have upon the filling and emptying of the lungs apart from a clearing of the glottal airway during inspiration. Some slight reflex effects may be induced if the respiratory centre is not completely depressed, but, as Prof. Schäfer wrote in the *Report of the Suspended Animation Committee of the Royal Medical and Chirurgical Society*, 1904: " Rhythmic contraction of the tongue could only operate when recovery from asphyxia was commencing." When an active method of artificial respiration which causes alternate increase and decrease in the size of the thoracic cavity is being employed, there seems to be no rational place for Laborde's method. One aim of the operator should be to maintain the airway fully open at all times, and consequently it is better to have the tongue pulled well forward for both inspiration and expiration if obstruction is to be avoided. A further objection to combining two methods of artificial respiration is the necessity for accurate synchronization of the movements of two individuals during a period of emergency. Recommended methods of artificial respiration should be simple and effective.

Sensitivity to Liver

Q.—*A woman aged 59 has had pernicious anaemia, comparatively mild, for some years, and has thriven on injections of liver extract, which she has had every few months because she is too lazy to have it oftener. About three months ago she nearly died with an allergic reaction such as has been described by Elizabeth Delikat (Journal, May 1, p. 539). I have started to desensitize her with examen, starting off with 1/20 c.cm with 3/20 c.cm. of adrenaline. She has now reached 12/20 of examen; her next dose will be 18/20, and in a few days she should touch her proper dose of 2 c.cm. Can you tell me how to ensure that she will not become resensitized when she gets back to therapeutic doses at intervals of a month or so? I am teaching her to inject herself so that small weekly doses will be feasible with or without adrenaline. Suppose she gets careless and omits treatment for two or three months—should she give herself 2 or 3 minims at, say, 10 a.m., repeat at 10.15, repeat at 10.30, and, if there is no trouble, have the rest of her dose at 11.30 a.m.?*

A.—A number of letters and articles have appeared in our columns recently on sensitivity to liver acquired during the treatment of pernicious anaemia. They have come apparently from haematologists, and most allergists would say that they minimize the difficulties and dangers of desensitization. The complete disappearance of allergy is rarely if ever accomplished by any type of therapy, and the term hyposensitization is therefore preferable to desensitization. The continued injection of the specific allergen binds or exhausts the humoral, cellular, and skin-sensitizing antibodies, so that the allergic reaction cannot occur. If treatment is interrupted the reacting antibodies may form again within a few weeks. For this reason, in the perennial treatment of hay-fever Rowe (*Clinical Allergy*, London, 1937) recommends that the inoculations should be given once a fortnight, and in the treatment of pernicious anaemia in patients who have become sensitive to liver it seems unduly hazardous to increase the interval beyond 3 weeks. Should the patient go more than a month without treatment it would be most unwise to allow her to inject herself. In this kind of case fatal reactions are not so very unusual, and therefore the full technique of desensitization by the " rush " method should be performed again. The patient must be under constant supervision, and an adrenaline syringe and a tourniquet must be at hand. Finally, patients who have become sensitive should be advised to take whole liver by mouth as frequently as possible, as a mild desensitization will occur by this route.

Treatment of Ascites

Q.—*What is the most effective treatment of ascites in a woman aged 42 suffering from chronic parenchymatous nephritis following acute rheumatism? There is a soft mitral systolic murmur. Oedema of the lower limbs occurs when patient sits out of bed. Theophylline, digitalis, scoparium, theocin, sodium acetate, caffeine citrate, saline aperients, tinct. ferri. perchlor., and urea have all been unsuccessful. Salt has been forbidden. Fluid intake has been restricted. Strict diet has been enforced. Epsom salts have been given freely. I am afraid to use the mersalylum group on account of the renal condition. I have not used thyroid gland on account of the cardiac condition.*

A.—The question does not give all the information one would wish before treating a case of this kind. For instance, what is the condition of the urine, and are blood cells and casts present? Again, before using drastic remedies—and they are the only ones likely to succeed in the face of so formidable a disturbance of the internal *milieu*—it is necessary to know the state of the blood chemistry, particularly the blood urea and the plasma chloride, bicarbonate, and proteins. The first three tests may need repetition twice weekly to control treatment. Assuming there is not much blood in the urine and no great elevation of blood urea, it is safer to use a mercurial diuretic than to let the patient remain ascitic. Mersalyl *B.P.*, 2 c.cm., should be injected intravenously twice a week. Acute fatal reactions are rare without some warning, but it is well to warn the relatives that they do occasionally occur in nephritis so treated, and a syringe containing adrenaline should be at hand for their treatment. If reactions do occur, it may be worth trying the effect of an intramuscular or intraperitoneal injection, as reactions are infrequent when the drug is given by these routes. The mercurial diuretic should be supported by the use of ammonium chloride, 15 grains 2-hourly during the day, in 5-grain capsules. In this way one may get in a total of 120 grains a day. Owing to the risk of dangerous acidosis, this treatment must be controlled by observations of the plasma bicarbonate. If the serum albumin is low and the blood urea is not high, a high protein diet should be given, supplementing the rations with household milk or one of the proprietary protein milks. Blood transfusions may be helpful if there is anaemia; but plasma transfusions have on the whole proved unsuccessful, probably owing to the difficulty of giving sufficient protein by this route. If the intake of salt is restricted, careful watch should be kept on the plasma chloride or this may be depleted, leading to hypochloraemia. Any tendency in this direction should be corrected by the free administration of salt. Restriction of fluid and purgation should be discountenanced as they make the patient miserable to no good

purpose. Thyroid is not likely to be effective in a case of this kind. If other remedies fail, the Osman treatment with massive doses of alkalis may be attempted; the effects of this treatment are sometimes rather hair-raising, and it would probably be wise to have the support of a colleague who has had some experience of it.

Bleeding after Tooth Extraction

Q.—*A patient of mine, a married woman in the late thirties, bleeds very easily after dental extraction. What is the best way to prevent and treat such bleeding in subsequent extractions?*

A.—Calcium, either by mouth or injection, may be given for two or three days before the dental operation. Not more than one tooth should be removed at a time, but if multiple extractions are essential great care must be taken in scaling and cleansing the mouth previously, as any congested state of the gum will cause a general ooze. After the extraction the patient should be instructed to bite tightly on to a small pad of gauze, not less than an inch thick, placed over the socket. This is left in position for the best part of an hour, and on returning home she sits supporting her chin in her hands. This allows a good clot to form and further trouble is unlikely, but, should this fail, the socket must be tightly packed with ribbon gauze soaked with bipp paste, and pressure again applied with the pad. The packing may be safely left for two days and the socket then is kept clean by gentle syringing.

Post-vaccinal Encephalomyelitis

Q.—*What is the aetiology of post-vaccinal encephalomyelitis?*

A.—The aetiology of this condition remains unknown. It is similar clinically and in its histological manifestations to the encephalomyelitis occurring in the course of other infections such as measles, small-pox, chicken-pox, etc. Some hold the view that these conditions are due to the virus causing the primary infection, and there is no doubt that the virus responsible for the primary infection does generalize. Vaccinia virus has been demonstrated in the central nervous system in post-vaccinal encephalitis, and recently the virus of measles has been isolated from the brain in a fatal case of post-measles encephalitis. One is not entitled to conclude, however, that the virus present in the central nervous system is necessarily responsible directly for the lesions, and it is possibly significant that the histology of the lesions in post-vaccinal encephalitis is unlike that of the lesions which can be produced in the brains of animals by the injection of vaccinia virus. The other views held as to the aetiology of this condition—that it is due to the lighting up of a dormant neurotropic virus or that it is an allergic phenomenon—remain pure hypothesis.

Effects of Sulphapyridine

Q.—*Is it not a fact that the reduction of oxyhaemoglobin to methaemoglobin and the interference of the normal function of the leucocytes by sulphapyridine constitute a serious threat in some people to the natural response of the body to pneumococcal invasion?*

A.—Methaemoglobinaemia reduces the oxygen-carrying powers of the blood, but not the oxygen tension; it can in any case be abolished within a few minutes by the intravenous injection of methylene blue. There is no evidence that sulphapyridine interferes with the normal *function* of the leucocytes, and the proportion of cases in which it interferes seriously with their *formation* is exceedingly small.

Recurring Erythema of Face

Q.—*I have under my care a woman of 43 who for the past 6 months has had recurring erythema of the face. Each attack lasts 3 to 4 days. Then follow 1 to 2 days with normal skin, after which the next attack ensues. A typical attack consists of erythema beginning on the chin and spreading to lips, cheeks, nose, and forehead. Along with intense erythema (the edge of which may be quite sharp) there is swelling of the skin and much pain. Oedema of the eyelids may occur. Over the most congested area scanty serous exudate may appear. In 2 to 3 days coarse desquamation occurs. General health is good. There are no signs of approaching menopause. An eminent skin specialist after several months' treatment has confessed himself puzzled. Protein skin tests give unconvincing results. Removal of one crowned tooth (another remains) has produced no effect. The only local application which produced some temporary benefit over a fortnight was sulphonamide cream. Vitamins and endocrines have been tried.*

A.—The condition here described is not unfamiliar to dermatologists. It most commonly occurs on the face and resembles erysipelas, but is without fever and constitutional disturbance. Sometimes the first attack is undoubtedly erysipelas, and therefore the subsequent recurrences are usually regarded as subclinical relapses in which a streptococcal infection plays a diminishing part, while the allergic reaction to the infection increases. Prolonged courses of sulphanilamide might be tried in doses of 1 to 3 g. a day with occasional checks on the blood count. Small doses of *x* rays (50–100 *r*) may be given at 2-weeks' interval, up to six treatments, in an attempt to desensitize the area affected. Local erythema doses of ultraviolet light may also cure the condition. More rational is the initial search for and the eradication of focal sepsis, but this appears to have been done. Specific desensitization by a streptococcal vaccine might be tried if preliminary patch and intradermal tests confirm the nature of the specific antigen. In old-standing cases the allergic reaction is often set up by anxiety states and emotion, and then the prognosis is bad and becomes even worse at the menopause. At this time of life a severe rosacea may give a very similar picture, but the eruption is symmetrical and the chin, nose, cheeks, and forehead are affected as a rule simultaneously.

Phlebitis

Q.—*What is the most recent treatment for phlebitis of superficial veins of the calf? I have a patient, a heavily built male aged 39 years, suffering from this complaint. Presumably it is not safe to allow walking until the clot is no longer palpable.*

A.—There is nothing very new in the treatment of phlebitis. If the condition can be traced to a focal infection the sulphonamides may help in clearing this up. The possibility of a migratory phlebitis, the precursor of a thrombo-angiitis obliterans, must be borne in mind. There has been some change of view regarding the length of rest required for safety. Unless there is evidence that the clotting has extended to the deeper veins, a considerably less time than that usually mentioned in the textbooks (i.e., three weeks after the last extension of the process) can be allowed with safety, since there is little tendency for clots in the superficial veins to become detached.

INCOME TAX

Subscriptions for War Charities, etc.

"X. Y. Z." refers to the appeal for subscriptions for funds to build a new hospital at Stalingrad, and asks whether such subscriptions can be treated as deductions for income-tax purposes.

*** No, such subscriptions cannot be regarded as "money wholly and exclusively laid out or expended for the purpose of the . . . profession." The case of a manufacturer or trader subscribing to a *local* hospital is on a different footing; such subscriptions are regarded as providing contingent benefits for the employees, and therefore an indirect addition to the cost of employing them.

LETTERS, NOTES, ETC.

Gentian Violet for Threadworms

Dr. A. J. HARDEN (Walsall) writes: I have treated several patients with gentian violet. The patients that had gelatin-coated capsules did not benefit, and faeces were not stained. I was then advised to use enteric-coated pills. These do cause the motion to be stained and effect a cure. (Martindale's *Extra Pharmacopoeia*, vol. I, page 257 (22nd edition).)

Derivatives of Theophylline for Asthma

"X." writes: Your otherwise excellent and informative annotation on "Theophylline for Asthma" (June 12, p. 731) is rather misleading in so far as the article by Carr, upon which it is based, deals entirely with the use of theophylline-ethylenediamine in the treatment of asthma, and not theophylline as suggested by your annotator. The distinction is an important one, as all the clinical (and experimental) evidence goes to show that in the treatment of asthma theophylline is not nearly so effective as certain of its derivatives, of which theophylline-ethylenediamine is by far the most extensively used up to date

Fulminating Meningococcal Septicaemia

Dr. G. E. LINDSAY writes: From time to time letters appear in the *Journal* describing the successful treatment of isolated cases of fulminating meningococcal septicaemia as if recovery in this condition were exceptionally rare. Over three years ago I saw a young soldier who had been taken ill the previous night. He was comatose, quite pulseless, and had extensive purpuric haemorrhages. He was then transferred immediately to the Cardiff City Isolation Hospital as a case of meningococcal septicaemia, which diagnosis was subsequently bacteriologically confirmed. The following morning I was surprised to find that, as a result of chemotherapy and the introduction intravenously of a litre or so of 5% glucose saline and intramuscular injections of adrenal cortical extract, the patient was quite rational and had a moderately good pulse. On discharge from hospital he was fully recovered. This method of treatment of fulminating meningococcal septicaemia was described by Dr. Emrys Harries early in March, 1940 (*Lancet*, **1**, 522), and, I believe, was first advocated by him.